DV Qualifiers in database - HIR

checked by IT 2/24/17

CETIFICATION

SDG No:	JC36372	Laboratory:	Accutest, New Jersey
Site:	BMSMC, Humacao, PR	Matrix:	Soil

SUMMARY: Soil samples (Table 1) were collected on the BMSMC facility. The BMSMC facility is located in Humacao, PR. Samples were taken January 26, 2017 and were analyzed in Accutest Laboratory of Dayton, New Jersey that reported the data under SDG No.: JC36372. Results were validated using the latest validation guidelines (July, 2015) of the EPA Hazardous Waste Support Section. The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. The data sample organic data samples summary form shows for analytes results that were qualified.

In summary the results are valid and can be used for decision taking purposes.

Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	MATRIX	ANALYSIS PERFORMED
JC36372-1	BKGSS-1	Soil	SVOCs; PAHs (SIM); LMWA; Pesticides; Metals
JC36372-2	BKGSS-2	Soil	SVOCs; PAHs (SIM); LMWA; Pesticides; Metals
JC36372-3	BKGSS-2 DUP	Soil	LMWA; Pesticides
JC36372-4	BKGSS-3	Soil	SVOCs; PAHs (SIM); LMWA; Pesticides; Metals
JC36372-4D	BKGSS-3 MSD	Soil	SVOCs; PAHs (SIM); LMWA; Pesticides; Metals
JC36372-4S	BKGSS-3 MS	Soil	SVOCs; PAHs (SIM); LMWA; Pesticides; Metals
JC36372-5	FB-012617	AQ – Field Blank Soil	SVOCs; PAHs (SIM); LMWA; Pesticides; Metals
JC36372-6	EB-012617	AQ – Equipment Blank	SVOCs; PAHs (SIM); LMWA; Pesticides; Metals

Reviewer Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: February 18, 2017

Raw Data: 6P34796.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-1		
Lab Sample ID:	JC36372-1	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3546	**Percent Solids:**	86.2
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P34796.D	1	02/08/17	AC	01/30/17	OP173	E6P1601
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	77	19	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	24	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	33	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	69	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	190	150	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	190	41	ug/kg	
95-48-7	2-Methylphenol	ND	77	25	ug/kg	
	3&4-Methylphenol	ND	77	32	ug/kg	
88-75-5	2-Nitrophenol	ND	190	26	ug/kg	
100-02-7	4-Nitrophenol	ND	390	100	ug/kg	
87-86-5	Pentachlorophenol	ND	150	36	ug/kg	
108-95-2	Phenol	ND	77	20	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	190	26	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	29	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	23	ug/kg	
83-32-9	Acenaphthene	48.4	39	13	ug/kg	
208-96-8	Acenaphthylene	ND	39	20	ug/kg	
98-86-2	Acetophenone	ND	190	8.3	ug/kg	
120-12-7	Anthracene	144	39	24	ug/kg	
1912-24-9	Atrazine	ND	77	17	ug/kg	
56-55-3	Benzo(a)anthracene	628	39	11	ug/kg	
50-32-8	Benzo(a)pyrene	632	39	18	ug/kg	
205-99-2	Benzo(b)fluoranthene	857	39	17	ug/kg	
191-24-2	Benzo(g,h,i)perylene	557	39	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	278	39	18	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	77	15	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	77	9.4	ug/kg	
92-52-4	1,1'-Biphenyl	ND	77	5.3	ug/kg	
100-52-7	Benzaldehyde	31.6	190	9.6	ug/kg	J
91-58-7	2-Chloronaphthalene	ND	77	9.2	ug/kg	
106-47-8	4-Chloroaniline	ND	190	14	ug/kg	
86-74-8	Carbazole	85.9	77	5.6	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BKG SS-1		
Lab Sample ID:	JC36372-1	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3546	**Percent Solids:**	86.2
Project:	BMSMC, PR		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	77	15	ug/kg	
218-01-9	Chrysene	620	39	12	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	77	8.3	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	77	17	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	77	14	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	77	13	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	39	12	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	39	19	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	77	32	ug/kg	
123-91-1	1,4-Dioxane	ND	39	26	ug/kg	
132-64-9	Dibenzofuran	21.0	77	16	ug/kg	J
84-74-2	Di-n-butyl phthalate	ND	77	6.3	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	77	9.6	ug/kg	
84-66-2	Diethyl phthalate	ND	77	8.2	ug/kg	
131-11-3	Dimethyl phthalate	ND	77	6.9	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	77	9.0	ug/kg	
206-44-0	Fluoranthene	1250	39	17	ug/kg	
86-73-7	Fluorene	34.6	39	18	ug/kg	J
118-74-1	Hexachlorobenzene	ND	77	9.8	ug/kg	
87-68-3	Hexachlorobutadiene	ND	39	16	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	390	15	ug/kg	
67-72-1	Hexachloroethane	ND	190	19	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	556	39	18	ug/kg	
78-59-1	Isophorone	ND	77	8.3	ug/kg	
90-12-0	1-Methylnaphthalene	ND	77	7.6	ug/kg	
91-57-6	2-Methylnaphthalene	ND	77	8.7	ug/kg	
88-74-4	2-Nitroaniline	ND	190	9.1	ug/kg	
99-09-2	3-Nitroaniline	ND	190	9.7	ug/kg	
100-01-6	4-Nitroaniline	ND	190	10	ug/kg	
91-20-3	Naphthalene	129	39	11	ug/kg	
98-95-3	Nitrobenzene	ND	77	15	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	77	11	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	14	ug/kg	
85-01-8	Phenanthrene	661	39	13	ug/kg	
129-00-0	Pyrene	1200	39	12	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	190	9.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	71%		23-115%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BKG SS-1		
Lab Sample ID:	JC36372-1	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3546	**Percent Solids:**	86.2
Project:	BMSMC, PR		

ABN Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	69%		27-114%
118-79-6	2,4,6-Tribromophenol	77%		19-152%
4165-60-0	Nitrobenzene-d5	69%		26-134%
321-60-8	2-Fluorobiphenyl	71%		39-124%
1718-51-0	Terphenyl-d14	69%		36-134%

ND = Not detected MDL = Method Detection Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	BKG SS-1		
Lab Sample ID:	JC36372-1	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	86.2
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M69657.D	1	01/30/17	SG	01/30/17	OP173A	E4M3201
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
53-70-3	Dibenzo(a,h)anthracene	93.2	3.9	0.90	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	52%		15-138%
321-60-8	2-Fluorobiphenyl	53%		12-148%
1718-51-0	Terphenyl-d14	72%		10-157%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	BKG SS-1		
Lab Sample ID:	JC36372-1	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846-8015C (DAI)	**Percent Solids:**	86.2
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH108422.D	1	01/30/17	XPL	n/a	n/a	GGH5640
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	120	80	ug/kg	
78-83-1	Isobutyl Alcohol	ND	120	68	ug/kg	
67-63-0	Isopropyl Alcohol	ND	120	66	ug/kg	
71-23-8	n-Propyl Alcohol	ND	120	47	ug/kg	
71-36-3	n-Butyl Alcohol	ND	120	63	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	120	62	ug/kg	
67-56-1	Methanol	ND	230	56	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	95%		52-141%
111-27-3	Hexanol	93%		52-141%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-1		
Lab Sample ID:	JC36372-1	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8081B SW846 3546	**Percent Solids:**	86.2
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4G77547.D	1	02/01/17	KD	01/31/17	OP215	G4G2017
Run #2							

	Initial Weight	Final Volume
Run #1	15.3 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.76	0.36	ug/kg	
319-84-6	alpha-BHC	ND	0.76	0.41	ug/kg	
319-85-7	beta-BHC	ND	0.76	0.48	ug/kg	
319-86-8	delta-BHC	ND	0.76	0.34	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	0.76	0.34	ug/kg	
5103-71-9	alpha-Chlordane	ND	0.76	0.36	ug/kg	
5103-74-2	gamma-Chlordane	ND	0.76	0.33	ug/kg	
60-57-1	Dieldrin	ND	0.76	0.38	ug/kg	
72-54-8	4,4'-DDD	ND	0.76	0.49	ug/kg	
72-55-9	4,4'-DDE	ND	0.76	0.40	ug/kg	
50-29-3	4,4'-DDT	ND	0.76	0.45	ug/kg	
72-20-8	Endrin	ND	0.76	0.36	ug/kg	
1031-07-8	Endosulfan sulfate	ND	0.76	0.30	ug/kg	
7421-93-4	Endrin aldehyde	ND	0.76	0.45	ug/kg	
959-98-8	Endosulfan-I	ND	0.76	0.40	ug/kg	
33213-65-9	Endosulfan-II	ND	0.76	0.40	ug/kg	
76-44-8	Heptachlor	ND	0.76	0.37	ug/kg	
1024-57-3	Heptachlor epoxide	ND	0.76	0.41	ug/kg	
72-43-5	Methoxychlor	ND	1.5	0.38	ug/kg	
53494-70-5	Endrin ketone	ND	0.76	0.58	ug/kg	
8001-35-2	Toxaphene	ND	19	7.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		25-135%
877-09-8	Tetrachloro-m-xylene	78%		25-135%
2051-24-3	Decachlorobiphenyl	130%		10-156%
2051-24-3	Decachlorobiphenyl	86%		10-156%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BKG SS-1		
Lab Sample ID:	JC36372-1	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
		Percent Solids:	86.2
Project:	BMSMC, PR		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	21800	55	2.2	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Antimony	0.39 B	2.2	0.32	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Arsenic	2.0 B	2.2	0.24	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Barium	113	22	0.089	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Beryllium	0.21 B	0.22	0.024	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Cadmium	0.14 B	0.55	0.055	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Calcium	6510	550	2.1	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Chromium	11.9	1.1	0.13	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Cobalt	15.2	5.5	0.065	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Copper	39.2	2.8	0.24	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Iron	35600	110	1.8	mg/kg	2	02/01/17	02/03/17	GT	SW846 6010C [3]	SW846 3050B [5]
Lead	7.7	2.2	0.25	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Magnesium	7630	550	6.5	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Manganese	873	1.7	0.040	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Mercury	0.031 B	0.035	0.0056	mg/kg	1	02/01/17	02/01/17	JA	SW846 7471B [1]	SW846 7471B [4]
Nickel	5.5	4.4	0.084	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Potassium	1580	1100	20	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Selenium	0.51 U	2.2	0.51	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Silver [a]	0.22 U	1.1	0.22	mg/kg	2	02/01/17	02/03/17	GT	SW846 6010C [3]	SW846 3050B [5]
Sodium	353 B	1100	4.3	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Thallium	0.44 U	1.1	0.44	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Vanadium	94.3	5.5	0.092	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]
Zinc	139	5.5	0.24	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA41277
(2) Instrument QC Batch: MA41293
(3) Instrument QC Batch: MA41305
(4) Prep QC Batch: MP98464
(5) Prep QC Batch: MP98469

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Raw Data: 6P34797.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-2		
Lab Sample ID:	JC36372-2	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3546	**Percent Solids:**	78.8
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P34797.D	1	02/08/17	AC	01/30/17	OP173	E6P1601
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	83	21	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	210	26	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	210	35	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	210	74	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	210	160	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	210	45	ug/kg	
95-48-7	2-Methylphenol	ND	83	27	ug/kg	
	3&4-Methylphenol	ND	83	34	ug/kg	
88-75-5	2-Nitrophenol	ND	210	28	ug/kg	
100-02-7	4-Nitrophenol	ND	420	110	ug/kg	
87-86-5	Pentachlorophenol	ND	170	39	ug/kg	
108-95-2	Phenol	ND	83	22	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	210	28	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	210	31	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	210	25	ug/kg	
83-32-9	Acenaphthene	ND	42	14	ug/kg	
208-96-8	Acenaphthylene	ND	42	21	ug/kg	
98-86-2	Acetophenone	ND	210	8.9	ug/kg	
120-12-7	Anthracene	ND	42	26	ug/kg	
1912-24-9	Atrazine	ND	83	18	ug/kg	
56-55-3	Benzo(a)anthracene	58.2	42	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	77.4	42	18	ug/kg	
191-24-2	Benzo(g,h,i)perylene	38.3	42	21	ug/kg	J
207-08-9	Benzo(k)fluoranthene	ND	42	19	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	83	16	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	83	10	ug/kg	
92-52-4	1,1'-Biphenyl	ND	83	5.7	ug/kg	
100-52-7	Benzaldehyde	52.4	210	10	ug/kg	J
91-58-7	2-Chloronaphthalene	ND	83	9.9	ug/kg	
106-47-8	4-Chloroaniline	ND	210	15	ug/kg	
86-74-8	Carbazole	ND	83	6.0	ug/kg	
105-60-2	Caprolactam	ND	83	16	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BKG SS-2		
Lab Sample ID:	JC36372-2	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3546	**Percent Solids:**	78.8
Project:	BMSMC, PR		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
218-01-9	Chrysene	88.2	42	13	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	83	8.9	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	83	18	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	83	15	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	83	13	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	42	13	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	42	21	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	83	35	ug/kg	
123-91-1	1,4-Dioxane	ND	42	28	ug/kg	
132-64-9	Dibenzofuran	ND	83	17	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	83	6.8	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	83	10	ug/kg	
84-66-2	Diethyl phthalate	ND	83	8.9	ug/kg	
131-11-3	Dimethyl phthalate	ND	83	7.4	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	83	9.7	ug/kg	
206-44-0	Fluoranthene	113	42	19	ug/kg	
86-73-7	Fluorene	ND	42	19	ug/kg	
118-74-1	Hexachlorobenzene	ND	83	11	ug/kg	
87-68-3	Hexachlorobutadiene	ND	42	17	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	420	17	ug/kg	
67-72-1	Hexachloroethane	ND	210	21	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	37.1	42	20	ug/kg	J
78-59-1	Isophorone	ND	83	8.9	ug/kg	
90-12-0	1-Methylnaphthalene	18.7	83	8.2	ug/kg	J
91-57-6	2-Methylnaphthalene	17.8	83	9.4	ug/kg	J
88-74-4	2-Nitroaniline	ND	210	9.8	ug/kg	
99-09-2	3-Nitroaniline	ND	210	10	ug/kg	
100-01-6	4-Nitroaniline	ND	210	11	ug/kg	
91-20-3	Naphthalene	27.2	42	12	ug/kg	J
98-95-3	Nitrobenzene	ND	83	16	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	83	12	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	210	15	ug/kg	
85-01-8	Phenanthrene	63.1	42	14	ug/kg	
129-00-0	Pyrene	91.8	42	13	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	210	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	55%		23-115%
4165-62-2	Phenol-d5	54%		27-114%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BKG SS-2		
Lab Sample ID:	JC36372-2	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3546	**Percent Solids:**	78.8
Project:	BMSMC, PR		

ABN Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	67%		19-152%
4165-60-0	Nitrobenzene-d5	55%		26-134%
321-60-8	2-Fluorobiphenyl	59%		39-124%
1718-51-0	Terphenyl-d14	60%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 4M69658.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-2		
Lab Sample ID:	JC36372-2	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	78.8
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M69658.D	1	01/30/17	SG	01/30/17	OP173A	E4M3201
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
50-32-8	Benzo(a)pyrene	39.1	4.2	1.0	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	7.85	4.2	0.97	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	39%		15-138%
321-60-8	2-Fluorobiphenyl	42%		12-148%
1718-51-0	Terphenyl-d14	65%		10-157%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH108421.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-2		
Lab Sample ID:	JC36372-2	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846-8015C (DAI)	**Percent Solids:**	78.8
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH108421.D	1	01/30/17	XPL	n/a	n/a	GGH5640
Run #2							

	Initial Weight
Run #1	5.2 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	120	84	ug/kg	
78-83-1	Isobutyl Alcohol	ND	120	72	ug/kg	
67-63-0	Isopropyl Alcohol	ND	120	70	ug/kg	
71-23-8	n-Propyl Alcohol	ND	120	49	ug/kg	
71-36-3	n-Butyl Alcohol	ND	120	66	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	120	65	ug/kg	
67-56-1	Methanol	ND	240	58	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	85%		52-141%
111-27-3	Hexanol	87%		52-141%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 4G77548.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-2		
Lab Sample ID:	JC36372-2	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8081B SW846 3546	**Percent Solids:**	78.8
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4G77548.D	1	02/01/17	KD	01/31/17	OP215	G4G2017
Run #2							

	Initial Weight	Final Volume
Run #1	15.1 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.84	0.40	ug/kg	
319-84-6	alpha-BHC	ND	0.84	0.45	ug/kg	
319-85-7	beta-BHC	ND	0.84	0.53	ug/kg	
319-86-8	delta-BHC	ND	0.84	0.38	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	0.84	0.37	ug/kg	
5103-71-9	alpha-Chlordane	ND	0.84	0.40	ug/kg	
5103-74-2	gamma-Chlordane	ND	0.84	0.37	ug/kg	
60-57-1	Dieldrin	ND	0.84	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	0.84	0.54	ug/kg	
72-55-9	4,4'-DDE	ND	0.84	0.44	ug/kg	
50-29-3	4,4'-DDT	ND	0.84	0.50	ug/kg	
72-20-8	Endrin	ND	0.84	0.39	ug/kg	
1031-07-8	Endosulfan sulfate	ND	0.84	0.34	ug/kg	
7421-93-4	Endrin aldehyde	ND	0.84	0.50	ug/kg	
959-98-8	Endosulfan-I	ND	0.84	0.44	ug/kg	
33213-65-9	Endosulfan-II	ND	0.84	0.44	ug/kg	
76-44-8	Heptachlor	ND	0.84	0.41	ug/kg	
1024-57-3	Heptachlor epoxide	ND	0.84	0.45	ug/kg	
72-43-5	Methoxychlor	ND	1.7	0.42	ug/kg	
53494-70-5	Endrin ketone	ND	0.84	0.65	ug/kg	
8001-35-2	Toxaphene	ND	21	8.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	88%		25-135%
877-09-8	Tetrachloro-m-xylene	81%		25-135%
2051-24-3	Decachlorobiphenyl	128%		10-156%
2051-24-3	Decachlorobiphenyl	80%		10-156%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BKG SS-2		
Lab Sample ID:	JC36372-2	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
		Percent Solids:	78.8
Project:	BMSMC, PR		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	18000	63	2.5	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Antimony	0.63 B	2.5	0.37	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Arsenic	1.6 B	2.5	0.27	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Barium	98.9	25	0.10	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.16 B	0.25	0.028	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.16 B	0.63	0.063	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Calcium	10000	630	2.4	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Chromium	20.4	1.3	0.15	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Cobalt	13.3	6.3	0.074	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Copper	38.3	3.1	0.27	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Iron	29200	63	1.0	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Lead	9.2	2.5	0.28	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Magnesium	7230	630	7.4	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Manganese	797	1.9	0.045	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.050	0.033	0.0053	mg/kg	1	02/01/17	02/01/17	JA	SW846 7471B [1]	SW846 7471B [3]
Nickel	13.5	5.0	0.095	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Potassium	2210	1300	23	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Selenium	0.58 U	2.5	0.58	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Silver	0.12 U	0.63	0.12	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Sodium	144 B	1300	4.9	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Thallium	0.50 U	1.3	0.50	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Vanadium	81.8	6.3	0.10	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Zinc	129	6.3	0.28	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA41277
(2) Instrument QC Batch: MA41293
(3) Prep QC Batch: MP98464
(4) Prep QC Batch: MP98469

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Raw Data: GH108420.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-2 DUP		
Lab Sample ID:	JC36372-3	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846-8015C (DAI)	**Percent Solids:**	77.7
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH108420.D	1	01/30/17	XPL	n/a	n/a	GGH5640
Run #2							

	Initial Weight
Run #1	5.2 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	120	85	ug/kg	
78-83-1	Isobutyl Alcohol	ND	120	73	ug/kg	
67-63-0	Isopropyl Alcohol	ND	120	71	ug/kg	
71-23-8	n-Propyl Alcohol	ND	120	50	ug/kg	
71-36-3	n-Butyl Alcohol	ND	120	67	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	120	66	ug/kg	
67-56-1	Methanol	ND	250	59	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	101%		52-141%
111-27-3	Hexanol	104%		52-141%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-2 DUP		
Lab Sample ID:	JC36372-3	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8081B SW846 3546	**Percent Solids:**	77.7
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4G77549.D	1	02/01/17	KD	01/31/17	OP215	G4G2017
Run #2							

	Initial Weight	Final Volume
Run #1	15.3 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.84	0.40	ug/kg	
319-84-6	alpha-BHC	ND	0.84	0.45	ug/kg	
319-85-7	beta-BHC	ND	0.84	0.53	ug/kg	
319-86-8	delta-BHC	ND	0.84	0.38	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	0.84	0.37	ug/kg	
5103-71-9	alpha-Chlordane	ND	0.84	0.40	ug/kg	
5103-74-2	gamma-Chlordane	ND	0.84	0.37	ug/kg	
60-57-1	Dieldrin	ND	0.84	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	0.84	0.54	ug/kg	
72-55-9	4,4'-DDE	ND	0.84	0.44	ug/kg	
50-29-3	4,4'-DDT	ND	0.84	0.50	ug/kg	
72-20-8	Endrin	ND	0.84	0.39	ug/kg	
1031-07-8	Endosulfan sulfate	ND	0.84	0.34	ug/kg	
7421-93-4	Endrin aldehyde	ND	0.84	0.50	ug/kg	
959-98-8	Endosulfan-I	ND	0.84	0.44	ug/kg	
33213-65-9	Endosulfan-II	ND	0.84	0.44	ug/kg	
76-44-8	Heptachlor	ND	0.84	0.41	ug/kg	
1024-57-3	Heptachlor epoxide	ND	0.84	0.45	ug/kg	
72-43-5	Methoxychlor	ND	1.7	0.42	ug/kg	
53494-70-5	Endrin ketone	ND	0.84	0.65	ug/kg	
8001-35-2	Toxaphene	ND	21	8.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	89%		24-136%
877-09-8	Tetrachloro-m-xylene	82%		24-136%
2051-24-3	Decachlorobiphenyl	126%		10-153%
2051-24-3	Decachlorobiphenyl	87%		10-153%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-3		
Lab Sample ID:	JC36372-4	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3546	**Percent Solids:**	86.7
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6P34798.D	1	02/08/17	AC	01/30/17	OP173	E6P1601
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	77	19	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	24	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	33	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	68	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	190	140	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	190	41	ug/kg	
95-48-7	2-Methylphenol	ND	77	25	ug/kg	
	3&4-Methylphenol	ND	77	32	ug/kg	
88-75-5	2-Nitrophenol	ND	190	25	ug/kg	
100-02-7	4-Nitrophenol	ND	380	100	ug/kg	
87-86-5	Pentachlorophenol	ND	150	36	ug/kg	
108-95-2	Phenol	ND	77	20	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	190	25	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	29	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	23	ug/kg	
83-32-9	Acenaphthene	36.6	38	13	ug/kg	J
208-96-8	Acenaphthylene	ND	38	20	ug/kg	
98-86-2	Acetophenone	18.9	190	8.3	ug/kg	J
120-12-7	Anthracene	57.8	38	24	ug/kg	
1912-24-9	Atrazine	ND	77	16	ug/kg	
56-55-3	Benzo(a)anthracene	161	38	11	ug/kg	
205-99-2	Benzo(b)fluoranthene	216	38	17	ug/kg	
191-24-2	Benzo(g,h,i)perylene	104	38	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	62.4	38	18	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	77	15	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	77	9.4	ug/kg	
92-52-4	1,1'-Biphenyl	ND	77	5.3	ug/kg	
100-52-7	Benzaldehyde	47.9	190	9.5	ug/kg	J
91-58-7	2-Chloronaphthalene	ND	77	9.2	ug/kg	
106-47-8	4-Chloroaniline	ND	190	14	ug/kg	
86-74-8	Carbazole	41.6	77	5.6	ug/kg	J
105-60-2	Caprolactam	ND	77	15	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BKG SS-3		
Lab Sample ID:	JC36372-4	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3546	**Percent Solids:**	86.7
Project:	BMSMC, PR		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
218-01-9	Chrysene	168	38	12	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	77	8.2	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	77	17	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	77	14	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	77	12	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	38	12	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	38	19	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	77	32	ug/kg	
123-91-1	1,4-Dioxane	ND	38	25	ug/kg	
132-64-9	Dibenzofuran	21.8	77	16	ug/kg	J
84-74-2	Di-n-butyl phthalate	ND	77	6.3	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	77	9.6	ug/kg	
84-66-2	Diethyl phthalate	ND	77	8.2	ug/kg	
131-11-3	Dimethyl phthalate	ND	77	6.8	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	77	9.0	ug/kg	
206-44-0	Fluoranthene	397	38	17	ug/kg	
86-73-7	Fluorene	22.4	38	18	ug/kg	J
118-74-1	Hexachlorobenzene	ND	77	9.7	ug/kg	
87-68-3	Hexachlorobutadiene	ND	38	15	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	380	15	ug/kg	
67-72-1	Hexachloroethane	ND	190	19	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	107	38	18	ug/kg	
78-59-1	Isophorone	ND	77	8.2	ug/kg	
90-12-0	1-Methylnaphthalene	ND	77	7.5	ug/kg	
91-57-6	2-Methylnaphthalene	ND	77	8.7	ug/kg	
88-74-4	2-Nitroaniline	ND	190	9.1	ug/kg	
99-09-2	3-Nitroaniline	ND	190	9.6	ug/kg	
100-01-6	4-Nitroaniline	ND	190	10	ug/kg	
91-20-3	Naphthalene	ND	38	11	ug/kg	
98-95-3	Nitrobenzene	ND	77	15	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	77	11	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	14	ug/kg	
85-01-8	Phenanthrene	292	38	13	ug/kg	
129-00-0	Pyrene	319	38	12	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	190	9.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	74%		23-115%
4165-62-2	Phenol-d5	71%		27-114%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BKG SS-3		
Lab Sample ID:	JC36372-4	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3546	**Percent Solids:**	86.7
Project:	BMSMC, PR		

ABN Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	79%		19-152%
4165-60-0	Nitrobenzene-d5	74%		26-134%
321-60-8	2-Fluorobiphenyl	72%		39-124%
1718-51-0	Terphenyl-d14	69%		36-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 4M69690.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-3		
Lab Sample ID:	JC36372-4	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	86.7
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M69690.D	1	02/02/17	SG	01/30/17	OP173A	E4M3203
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
50-32-8	Benzo(a)pyrene	135	3.8	0.93	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	23.2	3.8	0.90	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	53%		15-138%
321-60-8	2-Fluorobiphenyl	50%		12-148%
1718-51-0	Terphenyl-d14	72%		10-157%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-3		
Lab Sample ID:	JC36372-4	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846-8015C (DAI)	**Percent Solids:**	86.7
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH108417.D	1	01/30/17	XPL	n/a	n/a	GGH5640
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	120	80	ug/kg	
78-83-1	Isobutyl Alcohol	ND	120	68	ug/kg	
67-63-0	Isopropyl Alcohol	ND	120	66	ug/kg	
71-23-8	n-Propyl Alcohol	ND	120	46	ug/kg	
71-36-3	n-Butyl Alcohol	ND	120	63	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	120	61	ug/kg	
67-56-1	Methanol	ND	230	55	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	76%		52-141%
111-27-3	Hexanol	71%		52-141%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 4G77550.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	BKG SS-3		
Lab Sample ID:	JC36372-4	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
Method:	SW846 8081B SW846 3546	**Percent Solids:**	86.7
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4G77550.D	1	02/01/17	KD	01/31/17	OP215	G4G2017
Run #2							

	Initial Weight	Final Volume
Run #1	15.2 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.76	0.36	ug/kg	
319-84-6	alpha-BHC	ND	0.76	0.41	ug/kg	
319-85-7	beta-BHC	ND	0.76	0.48	ug/kg	
319-86-8	delta-BHC	ND	0.76	0.34	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	0.76	0.34	ug/kg	
5103-71-9	alpha-Chlordane	ND	0.76	0.36	ug/kg	
5103-74-2	gamma-Chlordane	ND	0.76	0.33	ug/kg	
60-57-1	Dieldrin	ND	0.76	0.38	ug/kg	
72-54-8	4,4'-DDD	ND	0.76	0.49	ug/kg	
72-55-9	4,4'-DDE	ND	0.76	0.40	ug/kg	
50-29-3	4,4'-DDT	ND	0.76	0.45	ug/kg	
72-20-8	Endrin	ND	0.76	0.36	ug/kg	
1031-07-8	Endosulfan sulfate	ND	0.76	0.30	ug/kg	
7421-93-4	Endrin aldehyde	ND	0.76	0.45	ug/kg	
959-98-8	Endosulfan-I	ND	0.76	0.40	ug/kg	
33213-65-9	Endosulfan-II	ND	0.76	0.40	ug/kg	
76-44-8	Heptachlor	ND	0.76	0.37	ug/kg	
1024-57-3	Heptachlor epoxide	ND	0.76	0.41	ug/kg	
72-43-5	Methoxychlor	ND	1.5	0.38	ug/kg	
53494-70-5	Endrin ketone	ND	0.76	0.59	ug/kg	
8001-35-2	Toxaphene	ND	19	7.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		24-136%
877-09-8	Tetrachloro-m-xylene	78%		24-136%
2051-24-3	Decachlorobiphenyl	118%		10-153%
2051-24-3	Decachlorobiphenyl	73%		10-153%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BKG SS-3		
Lab Sample ID:	JC36372-4	**Date Sampled:**	01/26/17
Matrix:	SO - Soil	**Date Received:**	01/27/17
		Percent Solids:	86.7
Project:	BMSMC, PR		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	17000	55	2.2	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Antimony	0.70 B	2.2	0.32	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Arsenic	1.8 B	2.2	0.24	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Barium	97.5	22	0.090	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.16 B	0.22	0.024	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.17 B	0.55	0.055	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Calcium	5110	550	2.1	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Chromium	12.6	1.1	0.13	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Cobalt	10.8	5.5	0.065	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Copper	35.3	2.8	0.24	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Iron	27200	55	0.88	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Lead	29.0	2.2	0.25	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Magnesium	4820	550	6.5	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Manganese	621	1.7	0.040	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.10	0.037	0.0059	mg/kg	1	02/01/17	02/01/17	JA	SW846 7471B [1]	SW846 7471B [3]
Nickel	6.2	4.4	0.084	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Potassium	1180	1100	20	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Selenium	0.51 U	2.2	0.51	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Silver	0.11 U	0.55	0.11	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Sodium	183 B	1100	4.3	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Thallium	0.44 U	1.1	0.44	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Vanadium	81.3	5.5	0.092	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]
Zinc	85.1	5.5	0.24	mg/kg	1	02/01/17	02/02/17	DE	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA41277
(2) Instrument QC Batch: MA41293
(3) Prep QC Batch: MP98464
(4) Prep QC Batch: MP98469

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Raw Data: 2P66764.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	FB012617		
Lab Sample ID:	JC36372-5	**Date Sampled:**	01/26/17
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2P66764.D	1	02/01/17	AC	01/31/17	OP202	E2P2932
Run #2							

	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.6	0.91	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.6	0.99	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.2	1.4	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.6	2.7	ug/l	
51-28-5	2,4-Dinitrophenol	ND	11	1.7	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.6	1.4	ug/l	
95-48-7	2-Methylphenol	ND	2.2	0.99	ug/l	
	3&4-Methylphenol	ND	2.2	0.98	ug/l	
88-75-5	2-Nitrophenol	ND	5.6	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	11	1.3	ug/l	
87-86-5	Pentachlorophenol	ND	4.4	1.5	ug/l	
108-95-2	Phenol	ND	2.2	0.44	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.6	1.6	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.6	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.6	1.0	ug/l	
83-32-9	Acenaphthene	ND	1.1	0.21	ug/l	
208-96-8	Acenaphthylene	ND	1.1	0.15	ug/l	
98-86-2	Acetophenone	ND	2.2	0.23	ug/l	
120-12-7	Anthracene	ND	1.1	0.23	ug/l	
1912-24-9	Atrazine	ND	2.2	0.50	ug/l	
100-52-7	Benzaldehyde	ND	5.6	0.32	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.1	0.23	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.1	0.23	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.1	0.38	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.1	0.23	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.2	0.45	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.2	0.51	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.1	0.24	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.2	0.26	ug/l	
106-47-8	4-Chloroaniline	ND	5.6	0.38	ug/l	
86-74-8	Carbazole	ND	1.1	0.25	ug/l	
105-60-2	Caprolactam	ND	2.2	0.72	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB012617		
Lab Sample ID:	JC36372-5	**Date Sampled:**	01/26/17
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
218-01-9	Chrysene	ND	1.1	0.20	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.2	0.31	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.2	0.28	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.2	0.45	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.2	0.41	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.1	0.61	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.1	0.53	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.2	0.56	ug/l	
123-91-1	1,4-Dioxane	ND	1.1	0.73	ug/l	
132-64-9	Dibenzofuran	ND	5.6	0.24	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.2	0.55	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.2	0.26	ug/l	
84-66-2	Diethyl phthalate	ND	2.2	0.29	ug/l	
131-11-3	Dimethyl phthalate	ND	2.2	0.24	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.2	1.8	ug/l	
206-44-0	Fluoranthene	ND	1.1	0.19	ug/l	
86-73-7	Fluorene	ND	1.1	0.19	ug/l	
118-74-1	Hexachlorobenzene	ND	1.1	0.36	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.1	0.55	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	11	3.1	ug/l	
67-72-1	Hexachloroethane	ND	2.2	0.43	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.1	0.37	ug/l	
78-59-1	Isophorone	ND	2.2	0.31	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	0.29	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	0.23	ug/l	
88-74-4	2-Nitroaniline	ND	5.6	0.31	ug/l	
99-09-2	3-Nitroaniline	ND	5.6	0.43	ug/l	
100-01-6	4-Nitroaniline	ND	5.6	0.49	ug/l	
91-20-3	Naphthalene	ND	1.1	0.26	ug/l	
98-95-3	Nitrobenzene	ND	2.2	0.71	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.2	0.53	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.6	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.1	0.19	ug/l	
129-00-0	Pyrene	ND	1.1	0.24	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.2	0.41	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	35%		10-110%
4165-62-2	Phenol-d5	27%		10-110%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB012617		
Lab Sample ID:	JC36372-5	**Date Sampled:**	01/26/17
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

ABN Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	76%		36-151%
4165-60-0	Nitrobenzene-d5	81%		34-128%
321-60-8	2-Fluorobiphenyl	87%		38-119%
1718-51-0	Terphenyl-d14	94%		26-129%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 4P20829.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	FB012617		
Lab Sample ID:	JC36372-5	**Date Sampled:**	01/26/17
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/27/17
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P20829.D	1	01/31/17	SG	01/31/17	OP202A	E4P1143
Run #2							

	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
50-32-8	Benzo(a)pyrene	ND	0.056	0.037	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.11	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	77%		24-125%
321-60-8	2-Fluorobiphenyl	60%		19-127%
1718-51-0	Terphenyl-d14	72%		10-119%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH108409.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	FB012617		
Lab Sample ID:	JC36372-5	**Date Sampled:**	01/26/17
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/27/17
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH108409.D	1	01/30/17	XPL	n/a	n/a	GGH5639
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	111%		56-145%
111-27-3	Hexanol	94%		56-145%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 8G2635.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	FB012617		
Lab Sample ID:	JC36372-5	**Date Sampled:**	01/26/17
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/27/17
Method:	SW846 8081B SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	8G2635.D	1	02/03/17	KD	02/01/17	OP233	G8G79
Run #2							

	Initial Volume	Final Volume
Run #1	920 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.011	0.0066	ug/l	
319-84-6	alpha-BHC	ND	0.011	0.0065	ug/l	
319-85-7	beta-BHC	ND	0.011	0.0062	ug/l	
319-86-8	delta-BHC	ND	0.011	0.0050	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.011	0.0030	ug/l	
5103-71-9	alpha-Chlordane	ND	0.011	0.0050	ug/l	
5103-74-2	gamma-Chlordane	ND	0.011	0.0050	ug/l	
60-57-1	Dieldrin	ND	0.011	0.0039	ug/l	
72-54-8	4,4'-DDD	ND	0.011	0.0041	ug/l	
72-55-9	4,4'-DDE	ND	0.011	0.0067	ug/l	
50-29-3	4,4'-DDT	ND	0.011	0.0054	ug/l	
72-20-8	Endrin	ND	0.011	0.0055	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.011	0.0057	ug/l	
7421-93-4	Endrin aldehyde	ND	0.011	0.0056	ug/l	
53494-70-5	Endrin ketone	ND	0.011	0.0055	ug/l	
959-98-8	Endosulfan-I	ND	0.011	0.0054	ug/l	
33213-65-9	Endosulfan-II	ND	0.011	0.0047	ug/l	
76-44-8	Heptachlor	ND	0.011	0.0041	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.011	0.0071	ug/l	
72-43-5	Methoxychlor	ND	0.022	0.0062	ug/l	
8001-35-2	Toxaphene	ND	0.27	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	90%		13-153%
877-09-8	Tetrachloro-m-xylene	89%		13-153%
2051-24-3	Decachlorobiphenyl	56%		10-138%
2051-24-3	Decachlorobiphenyl	48%		10-138%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB012617		
Lab Sample ID:	JC36372-5	**Date Sampled:**	01/26/17
Matrix:	AQ - Field Blank Soil	**Date Received:**	01/27/17
		Percent Solids:	n/a
Project:	BMSMC, PR		

Total Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	21 U	200	21	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Antimony	3.3 U	6.0	3.3	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Arsenic	2.2 U	3.0	2.2	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Barium	1.6 B	200	0.44	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Beryllium	0.25 U	1.0	0.25	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Cadmium	0.40 U	3.0	0.40	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Calcium	188 B	5000	33	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Chromium	0.81 U	10	0.81	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Cobalt	0.69 U	50	0.69	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Copper	2.4 U	10	2.4	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Iron	12 U	100	12	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Lead	2.3 U	3.0	2.3	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Magnesium	85 U	5000	85	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Manganese	5.1 B	15	0.39	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Mercury	0.047 U	0.20	0.047	ug/l	1	02/01/17	02/01/17	JPM	SW846 7470A [1]	SW846 7470A [4]
Nickel	0.76 U	10	0.76	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Potassium	120 U	10000	120	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Selenium	4.1 U	10	4.1	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Silver	0.88 U	10	0.88	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Sodium	154 B	10000	24	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Thallium	1.9 U	10	1.9	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Vanadium	0.66 U	50	0.66	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Zinc	1.3 U	20	1.3	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]

(1) Instrument QC Batch: MA41282
(2) Instrument QC Batch: MA41283
(3) Prep QC Batch: MP98461
(4) Prep QC Batch: MP98472

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Raw Data: 2P66765.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	EB012617		
Lab Sample ID:	JC36372-6	**Date Sampled:**	01/26/17
Matrix:	AQ - Equipment Blank	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2P66765.D	1	02/01/17	AC	01/31/17	OP202	E2P2932
Run #2							

	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.6	0.91	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.6	0.99	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.2	1.4	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.6	2.7	ug/l	
51-28-5	2,4-Dinitrophenol	ND	11	1.7	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.6	1.4	ug/l	
95-48-7	2-Methylphenol	ND	2.2	0.99	ug/l	
	3&4-Methylphenol	ND	2.2	0.98	ug/l	
88-75-5	2-Nitrophenol	ND	5.6	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	11	1.3	ug/l	
87-86-5	Pentachlorophenol	ND	4.4	1.5	ug/l	
108-95-2	Phenol	ND	2.2	0.44	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.6	1.6	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.6	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.6	1.0	ug/l	
83-32-9	Acenaphthene	ND	1.1	0.21	ug/l	
208-96-8	Acenaphthylene	ND	1.1	0.15	ug/l	
98-86-2	Acetophenone	ND	2.2	0.23	ug/l	
120-12-7	Anthracene	ND	1.1	0.23	ug/l	
1912-24-9	Atrazine	ND	2.2	0.50	ug/l	
100-52-7	Benzaldehyde	ND	5.6	0.32	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.1	0.23	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.1	0.23	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.1	0.38	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.1	0.23	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.2	0.45	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.2	0.51	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.1	0.24	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.2	0.26	ug/l	
106-47-8	4-Chloroaniline	ND	5.6	0.38	ug/l	
86-74-8	Carbazole	ND	1.1	0.25	ug/l	
105-60-2	Caprolactam	ND	2.2	0.72	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB012617		
Lab Sample ID:	JC36372-6	**Date Sampled:**	01/26/17
Matrix:	AQ - Equipment Blank	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
218-01-9	Chrysene	ND	1.1	0.20	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.2	0.31	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.2	0.28	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.2	0.45	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.2	0.41	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.1	0.61	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.1	0.53	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.2	0.56	ug/l	
123-91-1	1,4-Dioxane	ND	1.1	0.73	ug/l	
132-64-9	Dibenzofuran	ND	5.6	0.24	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.2	0.55	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.2	0.26	ug/l	
84-66-2	Diethyl phthalate	ND	2.2	0.29	ug/l	
131-11-3	Dimethyl phthalate	ND	2.2	0.24	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.2	1.8	ug/l	
206-44-0	Fluoranthene	ND	1.1	0.19	ug/l	
86-73-7	Fluorene	ND	1.1	0.19	ug/l	
118-74-1	Hexachlorobenzene	ND	1.1	0.36	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.1	0.55	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	11	3.1	ug/l	
67-72-1	Hexachloroethane	ND	2.2	0.43	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.1	0.37	ug/l	
78-59-1	Isophorone	ND	2.2	0.31	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	0.29	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	0.23	ug/l	
88-74-4	2-Nitroaniline	ND	5.6	0.31	ug/l	
99-09-2	3-Nitroaniline	ND	5.6	0.43	ug/l	
100-01-6	4-Nitroaniline	ND	5.6	0.49	ug/l	
91-20-3	Naphthalene	ND	1.1	0.26	ug/l	
98-95-3	Nitrobenzene	ND	2.2	0.71	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.2	0.53	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.6	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.1	0.19	ug/l	
129-00-0	Pyrene	ND	1.1	0.24	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.2	0.41	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	34%		10-110%
4165-62-2	Phenol-d5	26%		10-110%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB012617		
Lab Sample ID:	JC36372-6	**Date Sampled:**	01/26/17
Matrix:	AQ - Equipment Blank	**Date Received:**	01/27/17
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

ABN Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	81%		36-151%
4165-60-0	Nitrobenzene-d5	88%		34-128%
321-60-8	2-Fluorobiphenyl	98%		38-119%
1718-51-0	Terphenyl-d14	100%		26-129%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 4P20830.D

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Report of Analysis

Client Sample ID:	EB012617		
Lab Sample ID:	JC36372-6	**Date Sampled:**	01/26/17
Matrix:	AQ - Equipment Blank	**Date Received:**	01/27/17
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P20830.D	1	01/31/17	SG	01/31/17	OP202A	E4P1143
Run #2							

	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
50-32-8	Benzo(a)pyrene	ND	0.056	0.037	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.11	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	86%		24-125%
321-60-8	2-Fluorobiphenyl	65%		19-127%
1718-51-0	Terphenyl-d14	76%		10-119%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	EB012617		
Lab Sample ID:	JC36372-6	**Date Sampled:**	01/26/17
Matrix:	AQ - Equipment Blank	**Date Received:**	01/27/17
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH108410.D	1	01/30/17	XPL	n/a	n/a	GGH5639
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	115%		56-145%
111-27-3	Hexanol	102%		56-145%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 8G2636.D

SGS Accutest LabLink@945799 10:10 13-Feb-2017

Report of Analysis

Client Sample ID:	EB012617		
Lab Sample ID:	JC36372-6	**Date Sampled:**	01/26/17
Matrix:	AQ - Equipment Blank	**Date Received:**	01/27/17
Method:	SW846 8081B SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	8G2636.D	1	02/03/17	KD	02/01/17	OP233	G8G79
Run #2							

	Initial Volume	Final Volume
Run #1	910 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.011	0.0066	ug/l	
319-84-6	alpha-BHC	ND	0.011	0.0066	ug/l	
319-85-7	beta-BHC	ND	0.011	0.0063	ug/l	
319-86-8	delta-BHC	ND	0.011	0.0050	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.011	0.0031	ug/l	
5103-71-9	alpha-Chlordane	ND	0.011	0.0051	ug/l	
5103-74-2	gamma-Chlordane	ND	0.011	0.0050	ug/l	
60-57-1	Dieldrin	ND	0.011	0.0040	ug/l	
72-54-8	4,4'-DDD	ND	0.011	0.0042	ug/l	
72-55-9	4,4'-DDE	ND	0.011	0.0068	ug/l	
50-29-3	4,4'-DDT	ND	0.011	0.0054	ug/l	
72-20-8	Endrin	ND	0.011	0.0055	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.011	0.0058	ug/l	
7421-93-4	Endrin aldehyde	ND	0.011	0.0056	ug/l	
53494-70-5	Endrin ketone	ND	0.011	0.0056	ug/l	
959-98-8	Endosulfan-I	ND	0.011	0.0055	ug/l	
33213-65-9	Endosulfan-II	ND	0.011	0.0047	ug/l	
76-44-8	Heptachlor	ND	0.011	0.0042	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.011	0.0072	ug/l	
72-43-5	Methoxychlor	ND	0.022	0.0062	ug/l	
8001-35-2	Toxaphene	ND	0.27	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	86%		13-153%
877-09-8	Tetrachloro-m-xylene	85%		13-153%
2051-24-3	Decachlorobiphenyl	45%		10-138%
2051-24-3	Decachlorobiphenyl	38%		10-138%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: EB012617
Lab Sample ID: JC36372-6
Matrix: AQ - Equipment Blank
Project: BMSMC, PR

Date Sampled: 01/26/17
Date Received: 01/27/17
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	21 U	200	21	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Antimony	3.3 U	6.0	3.3	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Arsenic	2.2 U	3.0	2.2	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Barium	1.9 B	200	0.44	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Beryllium	0.25 U	1.0	0.25	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Cadmium	0.40 U	3.0	0.40	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Calcium	86.9 B	5000	33	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Chromium	0.81 U	10	0.81	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Cobalt	0.69 U	50	0.69	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Copper	2.4 U	10	2.4	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Iron	12 U	100	12	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Lead	2.3 U	3.0	2.3	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Magnesium	85 U	5000	85	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Manganese	2.1 B	15	0.39	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Mercury	0.067 B	0.20	0.047	ug/l	1	02/01/17	02/01/17	JPM	SW846 7470A [1]	SW846 7470A [4]
Nickel	1.0 B	10	0.76	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Potassium	120 U	10000	120	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Selenium	4.1 U	10	4.1	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Silver	0.88 U	10	0.88	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Sodium	65.7 B	10000	24	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Thallium	1.9 U	10	1.9	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Vanadium	0.66 U	50	0.66	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]
Zinc	1.3 U	20	1.3	ug/l	1	01/31/17	02/01/17	DE	SW846 6010C [2]	SW846 3010A [3]

(1) Instrument QC Batch: MA41282
(2) Instrument QC Batch: MA41283
(3) Prep QC Batch: MP98461
(4) Prep QC Batch: MP98472

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Raw Data: 6P34799.D 6P34800.D

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC36372
Account: AMANYWP Anderson, Mulholland & Associates
Project: BMSMC, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP173-MS	6P34799.D	1	02/08/17	AC	01/30/17	OP173	E6P1601
OP173-MSD	6P34800.D	1	02/08/17	AC	01/30/17	OP173	E6P1601
JC36372-4	6P34798.D	1	02/08/17	AC	01/30/17	OP173	E6P1601

The QC reported here applies to the following samples: **Method:** SW846 8270D

JC36372-1, JC36372-2, JC36372-4

CAS No.	Compound	JC36372-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
95-57-8	2-Chlorophenol	ND		1910	1200	63	1910	1120	59	7	10-137/34
59-50-7	4-Chloro-3-methyl phenol	ND		1910	1420	74	1910	1270	67	11	11-147/35
120-83-2	2,4-Dichlorophenol	ND		1910	1450	76	1910	1300	68	11	15-140/34
105-67-9	2,4-Dimethylphenol	ND		1910	1190	62	1910	1050	55	13	10-151/34
51-28-5	2,4-Dinitrophenol	ND		3820	1950	51	3820	1440	38	30	10-148/49
534-52-1	4,6-Dinitro-o-cresol	ND		1910	1090	57	1910	798	42	31	10-150/48
95-48-7	2-Methylphenol	ND		1910	1210	63	1910	1120	59	8	10-138/33
	3&4-Methylphenol	ND		1910	1230	64	1910	1140	60	8	10-143/33
88-75-5	2-Nitrophenol	ND		1910	1540	81	1910	1460	76	5	10-150/39
100-02-7	4-Nitrophenol	ND		1910	1740	91	1910	1500	79	15	10-163/38
87-86-5	Pentachlorophenol	ND		1910	1850	97	1910	1570	82	16	10-148/39
108-95-2	Phenol	ND		1910	1240	65	1910	1150	60	8	24-114/32
58-90-2	2,3,4,6-Tetrachlorophenol	ND		1910	1430	75	1910	1250	65	13	14-140/38
95-95-4	2,4,5-Trichlorophenol	ND		1910	1470	77	1910	1290	68	13	10-146/36
88-06-2	2,4,6-Trichlorophenol	ND		1910	1460	76	1910	1310	69	11	16-148/36
83-32-9	Acenaphthene	36.6	J	1910	1550	79	1910	1370	70	12	21-136/34
208-96-8	Acenaphthylene	ND		1910	1410	74	1910	1270	67	10	10-143/36
98-86-2	Acetophenone	18.9	J	1910	1310	68	1910	1260	65	4	24-127/31
120-12-7	Anthracene	57.8		1910	1480	74	1910	1340	67	10	10-147/39
1912-24-9	Atrazine	ND		1910	1440	75	1910	1310	69	9	10-161/38
56-55-3	Benzo(a)anthracene	161		1910	1670	79	1910	1420	66	16	10-151/41
50-32-8	Benzo(a)pyrene	143		1910	1590	76	1910	1410	66	12	10-149/40
205-99-2	Benzo(b)fluoranthene	216		1910	1590	72	1910	1420	63	11	10-147/42
191-24-2	Benzo(g,h,i)perylene	104		1910	1700	84	1910	1550	76	9	10-150/41
207-08-9	Benzo(k)fluoranthene	62.4		1910	1440	72	1910	1310	65	9	12-142/41
101-55-3	4-Bromophenyl phenyl ether	ND		1910	1570	82	1910	1380	72	13	26-138/37
85-68-7	Butyl benzyl phthalate	ND		1910	1610	84	1910	1400	73	14	24-143/36
92-52-4	1,1'-Biphenyl	ND		1910	1490	78	1910	1350	71	10	18-138/32
100-52-7	Benzaldehyde	47.9	J	1910	1180	59	1910	1210	61	3	10-149/37
91-58-7	2-Chloronaphthalene	ND		1910	1520	80	1910	1390	73	9	24-130/31
106-47-8	4-Chloroaniline	ND		1910	602	32	1910	453	24	28	10-111/52
86-74-8	Carbazole	41.6	J	1910	1450	74	1910	1300	66	11	12-146/39
105-60-2	Caprolactam	ND		1910	1160	61	1910	1010	53	14	10-147/40
218-01-9	Chrysene	168		1910	1660	78	1910	1430	66	15	10-151/41
111-91-1	bis(2-Chloroethoxy)methane	ND		1910	1460	76	1910	1330	70	9	10-144/35
111-44-4	bis(2-Chloroethyl)ether	ND		1910	1420	74	1910	[illegible]	74	1	12-142/35

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC36372
Account: AMANYWP Anderson, Mulholland & Associates
Project: BMSMC, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP173-MS	6P34799.D	1	02/08/17	AC	01/30/17	OP173	E6P1601
OP173-MSD	6P34800.D	1	02/08/17	AC	01/30/17	OP173	E6P1601
JC36372-4	6P34798.D	1	02/08/17	AC	01/30/17	OP173	E6P1601

The QC reported here applies to the following samples: **Method:** SW846 8270D

JC36372-1, JC36372-2, JC36372-4

CAS No.	Compound	JC36372-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
108-60-1	bis(2-Chloroisopropyl)ether	ND		1910	1310	69	1910	1280	67	2	10-137/33
7005-72-3	4-Chlorophenyl phenyl ether	ND		1910	1500	79	1910	1340	70	11	21-136/35
121-14-2	2,4-Dinitrotoluene	ND		1910	1730	91	1910	1550	81	11	14-148/41
606-20-2	2,6-Dinitrotoluene	ND		1910	1670	87	1910	1490	78	11	14-152/40
91-94-1	3,3'-Dichlorobenzidine	ND		3820	678	18	3820	667	17	2	10-137/47
123-91-1	1,4-Dioxane	ND		1910	555	29	1910	751	39	30	10-110/40
132-64-9	Dibenzofuran	21.8	J	1910	1480	76	1910	1320	68	11	17-141/36
84-74-2	Di-n-butyl phthalate	ND		1910	1380	72	1910	1260	66	9	26-137/35
117-84-0	Di-n-octyl phthalate	ND		1910	1350	71	1910	1230	64	9	23-145/36
84-66-2	Diethyl phthalate	ND		1910	1470	77	1910	1300	68	12	25-133/35
131-11-3	Dimethyl phthalate	ND		1910	1500	79	1910	1340	70	11	21-134/36
117-81-7	bis(2-Ethylhexyl)phthalate	ND		1910	1840	96	1910	1380	72	29	26-144/39
206-44-0	Fluoranthene	397		1910	1780	72	1910	1590	62	11	10-151/44
86-73-7	Fluorene	22.4	J	1910	1480	76	1910	1300	67	13	19-133/36
118-74-1	Hexachlorobenzene	ND		1910	1500	79	1910	1360	71	10	18-142/37
87-68-3	Hexachlorobutadiene	ND		1910	1430	75	1910	1360	71	5	16-137/32
77-47-4	Hexachlorocyclopentadiene	ND		3820	486	13	3820	375	10	26	10-150/50
67-72-1	Hexachloroethane	ND		1910	986	52	1910	915	48	7	10-131/38
193-39-5	Indeno(1,2,3-cd)pyrene	107		1910	1920	95	1910	1720	84	11	10-148/41
78-59-1	Isophorone	ND		1910	1370	72	1910	1250	65	9	11-142/33
90-12-0	1-Methylnaphthalene	ND		1910	1350	71	1910	1210	63	11	10-144/35
91-57-6	2-Methylnaphthalene	ND		1910	1450	76	1910	1330	70	9	10-141/35
88-74-4	2-Nitroaniline	ND		1910	1630	85	1910	1380	72	17	14-156/38
99-09-2	3-Nitroaniline	ND		1910	1090	57	1910	897	47	19	10-144/45
100-01-6	4-Nitroaniline	ND		1910	1040	54	1910	939	49	10	10-156/44
91-20-3	Naphthalene	ND		1910	1350	71	1910	1330	70	1	10-136/36
98-95-3	Nitrobenzene	ND		1910	1400	73	1910	1330	70	5	10-142/34
621-64-7	N-Nitroso-di-n-propylamine	ND		1910	1260	66	1910	1200	63	5	10-142/31
86-30-6	N-Nitrosodiphenylamine	ND		1910	1500	79	1910	1370	72	9	10-156/37
85-01-8	Phenanthrene	292		1910	1740	76	1910	1520	64	13	11-145/45
129-00-0	Pyrene	319		1910	1880	82	1910	1610	68	15	11-155/44
95-94-3	1,2,4,5-Tetrachlorobenzene	ND		1910	1680	88	1910	1500	79	11	23-136/32

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC36372
Account: AMANYWP Anderson, Mulholland & Associates
Project: BMSMC, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP173-MS	6P34799.D	1	02/08/17	AC	01/30/17	OP173	E6P1601
OP173-MSD	6P34800.D	1	02/08/17	AC	01/30/17	OP173	E6P1601
JC36372-4	6P34798.D	1	02/08/17	AC	01/30/17	OP173	E6P1601

The QC reported here applies to the following samples: **Method:** SW846 8270D

JC36372-1, JC36372-2, JC36372-4

CAS No.	Surrogate Recoveries	MS	MSD	JC36372-4	Limits
367-12-4	2-Fluorophenol	76%	75%	74%	23-115%
4165-62-2	Phenol-d5	77%	72%	71%	27-114%
118-79-6	2,4,6-Tribromophenol	91%	83%	79%	19-152%
4165-60-0	Nitrobenzene-d5	75%	73%	74%	26-134%
321-60-8	2-Fluorobiphenyl	81%	73%	72%	39-124%
1718-51-0	Terphenyl-d14	83%	72%	69%	36-134%

* = Outside of Control Limits.

Raw Data: 4M69677.D 4M69691.D

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC36372
Account: AMANYWP Anderson, Mulholland & Associates
Project: BMSMC, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP173A-MS	4M69677.D	1	01/31/17	SG	01/30/17	OP173A	E4M3202
OP173A-MSD	4M69691.D	1	02/02/17	SG	01/30/17	OP173A	E4M3203
JC36372-4	4M69690.D	1	02/02/17	SG	01/30/17	OP173A	E4M3203

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

JC36372-1, JC36372-2, JC36372-4

CAS No.	Compound	JC36372-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
50-32-8	Benzo(a)pyrene	135		37.9	220	224* [a]	37.8	564	1134* [a]	88* [b]	18-188/44
53-70-3	Dibenzo(a,h)anthracene	23.2		37.9	59.9	97	37.8	118	251* [a]	65* [b]	28-169/41

CAS No.	Surrogate Recoveries	MS	MSD	JC36372-4	Limits
4165-60-0	Nitrobenzene-d5	49%	57%	53%	15-138%
321-60-8	2-Fluorobiphenyl	61%	54%	50%	12-148%
1718-51-0	Terphenyl-d14	84%	74%	72%	10-157%

(a) Outside of in house control limits due to possible sample nonhomogeneity.
(b) Analytical precision exceeds in-house control limits.

* = Outside of Control Limits.

6.3.3

Raw Data: GH108418.D GH108419.D

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC36372
Account: AMANYWP Anderson, Mulholland & Associates
Project: BMSMC, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC36372-4MS	GH108418.D	1	01/30/17	XPL	n/a	n/a	GGH5640
JC36372-4MSD	GH108419.D	1	01/30/17	XPL	n/a	n/a	GGH5640
JC36372-4	GH108417.D	1	01/30/17	XPL	n/a	n/a	GGH5640

The QC reported here applies to the following samples: **Method:** SW846-8015C (DAI)

JC36372-1, JC36372-2, JC36372-3, JC36372-4

CAS No.	Compound	JC36372-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
64-17-5	Ethanol	ND		5770	6290	109	5770	4730	82	28* [a]	64-132/22
78-83-1	Isobutyl Alcohol	ND		5770	6650	115	5770	5550	96	18	59-141/26
67-63-0	Isopropyl Alcohol	ND		5770	6580	114	5770	4730	82	33* [a]	69-131/23
71-23-8	n-Propyl Alcohol	ND		5770	6490	113	5770	7660	133	17	66-135/31
71-36-3	n-Butyl Alcohol	ND		5770	6730	117	5770	6190	107	8	50-140/30
78-92-2	sec-Butyl Alcohol	ND		5770	7450	129	5770	6690	116	11	67-131/30
67-56-1	Methanol	ND		5770	6430	111	5770	3890	67	49* [a]	58-130/29

CAS No.	Surrogate Recoveries	MS	MSD	JC36372-4	Limits
111-27-3	Hexanol	112%	93%	76%	52-141%
111-27-3	Hexanol	109%	94%	71%	52-141%

(a) High percent recoveries and no associated positive reported in the QC batch.

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* = Outside of Control Limits.

Raw Data: 4G77551.D 4G77552.D

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC36372
Account: AMANYWP Anderson, Mulholland & Associates
Project: BMSMC, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP215-MS	4G77551.D	1	02/01/17	KD	01/31/17	OP215	G4G2017
OP215-MSD	4G77552.D	1	02/01/17	KD	01/31/17	OP215	G4G2017
JC36372-4	4G77550.D	1	02/01/17	KD	01/31/17	OP215	G4G2017

The QC reported here applies to the following samples: **Method:** SW846 8081B

JC36372-1, JC36372-2, JC36372-3, JC36372-4

CAS No.	Compound	JC36372-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
309-00-2	Aldrin	ND		19	46.9	247* [a]	19	17.0	90	94* [a]	23-143/44
319-84-6	alpha-BHC	ND		19	17.4	92	19	17.5	92	1	18-152/47
319-85-7	beta-BHC	ND		19	9.0	47	19	16.9	89	61* [a]	7-143/48
319-86-8	delta-BHC	ND		19	19.5	103	19	19.8	104	2	13-155/49
58-89-9	gamma-BHC (Lindane)	ND		19	18.5	98	19	18.1	95	2	23-138/49
5103-71-9	alpha-Chlordane	ND		19	17.0	90	19	20.1	106	17	16-149/46
5103-74-2	gamma-Chlordane	ND		19	12.3	65	19	16.4	86	29	14-152/45
60-57-1	Dieldrin	ND		19	16.9	89	19	17.7	93	5	14-154/46
72-54-8	4,4'-DDD	ND		19	17.2	91	19	16.6	88	4	18-149/51
72-55-9	4,4'-DDE	ND		19	12.9	68	19	16.4	86	24	10-154/49
50-29-3	4,4'-DDT	ND		19	17.8	94	19	16.7	88	6	10-170/50
72-20-8	Endrin	ND		19	22.6	119	19	21.2	112	6	18-173/49
1031-07-8	Endosulfan sulfate	ND		19	14.3	75	19	14.8	78	3	19-132/50
7421-93-4	Endrin aldehyde	ND		19	25.8	136	19	16.3	86	45	10-160/53
959-98-8	Endosulfan-I	ND		19	16.3	86	19	16.7	88	2	18-143/46
33213-65-9	Endosulfan-II	ND		19	16.4	86	19	16.4	86	0	21-132/46
76-44-8	Heptachlor	ND		19	19.9	105	19	19.7	104	1	22-146/46
1024-57-3	Heptachlor epoxide	ND		19	18.0	95	19	18.9	100	5	21-151/45
72-43-5	Methoxychlor	ND		19	20.3	107	19	15.9	84	24	11-166/50
53494-70-5	Endrin ketone	ND		19	19.6	103	19	16.2	85	19	8-179/51
8001-35-2	Toxaphene	ND			ND			ND		nc	50-150/30

CAS No.	Surrogate Recoveries	MS	MSD	JC36372-4	Limits
877-09-8	Tetrachloro-m-xylene	83%	88%	84%	25-135%
877-09-8	Tetrachloro-m-xylene	76%	80%	78%	25-135%
2051-24-3	Decachlorobiphenyl	112%	103%	118%	10-156%
2051-24-3	Decachlorobiphenyl	78%	69%	73%	10-156%

(a) Outside the QC limits.

* = Outside of Control Limits.

10.3.1 10

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC36372
Account: AMANYWP - Anderson, Mulholland & Associates
Project: BMSMC, PR

QC Batch ID: MP98464
Matrix Type: SOLID

Methods: SW846 7471B
Units: mg/kg

Prep Date: 02/01/17

Metal	JC36372-4 Original	MS	Spikelot HGPWS1	% Rec	QC Limits
Mercury	0.10	0.46	0.373	96.6	80-120

Associated samples MP98464: JC36372-1, JC36372-2, JC36372-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

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12.7.2 12

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC36372
Account: AMANYWP - Anderson, Mulholland & Associates
Project: BMSMC, PR

QC Batch ID: MP98464
Matrix Type: SOLID

Methods: SW846 7471B
Units: mg/kg

Prep Date: 02/01/17

Metal	JC36372-4 Original	MSD	Spikelot HGPWS1	% Rec	MSD RPD	QC Limit
Mercury	0.10	0.46	0.378	95.1	0.0	20

Associated samples MP98464: JC36372-1, JC36372-2, JC36372-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

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MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC36372
Account: AMANYWP - Anderson, Mulholland & Associates
Project: BMSMC, PR

QC Batch ID: MP98469
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 02/01/17

Metal	JC36372-4 Original	MS	Spikelot MPSPK2	% Rec	QC Limits
Aluminum	17000	31800	2880	513.3(a)	75-125
Antimony	0.70	103	231	44.3N(b)	75-125
Arsenic	1.8	247	231	106.3	75-125
Barium	97.5	437	231	147.2N(b	75-125
Beryllium	0.16	257	231	111.3	75-125
Bismuth					
Boron					
Cadmium	0.17	252	231	109.2	75-125
Calcium	5110	11600	2880	225.1N(b	75-125
Chromium	12.6	272	231	112.4	75-125
Cobalt	10.8	270	231	112.4	75-125
Copper	35.3	305	231	116.9	75-125
Iron	27200	39000	2880	409.2(a)	75-125
Lead	29.0	287	231	111.8	75-125
Lithium					
Magnesium	4820	9100	2880	148.4N(b	75-125
Manganese	621	1450	231	359.4N(b	75-125
Molybdenum	anr				
Nickel	6.2	265	231	112.2	75-125
Palladium					
Phosphorus					
Potassium	1180	4870	2880	128.0N(b	75-125
Selenium	0.0	247	231	107.1	75-125
Silicon					
Silver	0.0	30.1	28.8	104.4	75-125
Sodium	183	3550	2880	116.8	75-125
Strontium					
Sulfur	anr				
Thallium	0.21	250	231	108.3	75-125
Tin					
Titanium	anr				
Tungsten					
Vanadium	81.3	346	231	114.7	75-125

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MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC36372
Account: AMANYWP - Anderson, Mulholland & Associates
Project: BMSMC, PR

QC Batch ID: MP98469
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 02/01/17

Metal	JC36372-4 Original	MS	Spikelot MPSPK2	% Rec	QC Limits
Zinc	85.1	339	231	110.1	75-125

Zirconium

Associated samples MP98469: JC36372-1, JC36372-2, JC36372-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
(b) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

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12.8.2 12

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC36372
Account: AMANYWP - Anderson, Mulholland & Associates
Project: BMSMC, PR

QC Batch ID: MP98469
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 02/01/17

Metal	JC36372-4 Original	MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Aluminum	17000	25900	2800	317.9(a)	20.5 (b)	20
Antimony	0.70	103	224	45.7N(c)	0.0	20
Arsenic	1.8	228	224	101.0	8.0	20
Barium	97.5	338	224	107.4	25.5 (b)	20
Beryllium	0.16	237	224	105.8	8.1	20
Bismuth						
Boron						
Cadmium	0.17	234	224	104.4	7.4	20
Calcium	5110	8440	2800	118.9	31.5 (b)	20
Chromium	12.6	245	224	103.8	10.4	20
Cobalt	10.8	245	224	104.6	9.7	20
Copper	35.3	274	224	106.6	10.7	20
Iron	27200	29800	2800	92.9	26.7 (b)	20
Lead	29.0	256	224	101.4	11.4	20
Lithium						
Magnesium	4820	7540	2800	97.2	18.8	20
Manganese	621	848	224	101.4	52.4 (b)	20
Molybdenum	anr					
Nickel	6.2	242	224	105.3	9.1	20
Palladium						
Phosphorus						
Potassium	1180	4280	2800	110.7	12.9	20
Selenium	0.0	229	224	102.2	7.6	20
Silicon						
Silver	0.0	28.6	28	102.2	5.1	20
Sodium	183	3230	2800	108.8	9.4	20
Strontium						
Sulfur	anr					
Thallium	0.21	234	224	104.4	6.6	20
Tin						
Titanium	anr					
Tungsten						
Vanadium	81.3	309	224	101.7	11.3	20

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC36372
Account: AMANYWP - Anderson, Mulholland & Associates
Project: BMSMC, PR

QC Batch ID: MP98469
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 02/01/17

Metal	JC36372-4 Original	MSD	Spikelot MPSPK2	% Rec	MSD RPD	QC Limit
Zinc	85.1	305	224	98.2	10.6	20
Zirconium						

Associated samples MP98469: JC36372-1, JC36372-2, JC36372-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
(b) High rpd due to possible sample nonhomogeneity.
(c) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

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Master # 772836410 60 | SGS Accutest Job # JC36372

Client / Reporting Information

Company Name: Anderson Mulholland & Associates
Street Address: 2700 Westchester Avenue, Suite 417
City: Purchase | State: NY | Zip: 10577
Project Contact: Terry Taylor | E-mail:
Phone #: 914-251-0400 | Fax #:
Sampler(s) Name(s): | Phone #:

Project Information

Project Name: Bristol-Myers Squibb Manufacturing Co., Surface Soil Sampling
Street:
City: Humacao | State: PR
Project #:
Client Purchase Order #:
Project Manager: Terry Taylor

Billing Information (if different from Report to)
Company Name:
Street Address:
City: | State: | Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Item #	Field ID / Point of Collection	MEOH Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Preservation: HCl	Preservation: NaOH	Preservation: ZnOAc/NaOH	Preservation: H2SO4	Preservation: None	Preservation: MeOH	Preservation: Encore	DB015LMA	PS081PESTTCL	AB8270SL (SVOCs)	BSIM + Benzo(e)pyrene	BSIM + Dibenz(a,h)anthracene	METALS - SEE COMMENTS FOR LIST	METAL - HG	LAB USE ONLY
1	BKG SS-1		1/26/17	0930	TT	SO	5					5			X	X	X	X	X	X	X	J8
2	BKG SS-2		1/26/17	1030	TT	SO	5					5			X	X	X	X	X	X	X	C48 T4
3	BKG SS-2 DUP		1/26/17	1030	TT	SO	2					2			X	X						E73 T2
	BKG SS-3		1/26/17	1145	TT	SO	5					5			X	X	X	X	X	X	X	E73
4	BKG SS-3 MS		1/26/17	1145	TT	SO	5					5			X	X	X	X	X	X	X	A35
	BKG SS-3 MSD		1/26/17	1145	TT	SO	5					5			X	X	X	X	X	X	X	1/1141
5	FB012617		1/26/17	1145	TT	FB	8	3	1			4			X	X	X	X	X	X	X	
6	EB012617		1/26/17	1145	TT	EB	8	3	1			4			X	X	X	X	X	X	X	

INITIAL ASSESSMENT
LABEL VERIFICATION

Turnaround Time (Business days)

Approved By (SGS Accutest PM): / Date:

- [X] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available VIA Labline

DMa Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [X] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only, Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Metals to consist of: Al,Sb,As,Ba,Be,Cd,Ca,Cr,Co,Fe,Pb,Mg,Mn,Ni,K,Se,Ag,Na,Tl,V,Zn

Include 1-Methylnaphthalene in AB8270SL

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler	Date Time	Received By	Relinquished By	Date Time	Received By
1	[signature]	1/26/17 2200	1 Fed EX	2 [signature]	1/27/17 1330	2 [signature]
3	Relinquished by Sampler	Date Time:	3	4		4
5	Relinquished by:	Date Time:	5	Custody Seal # T62, 164, 166, 165 Intact / Not Intact	Preserved where applicable	On Ice 8 Cooler Temp 20, 22, 19, 20

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EXECUTIVE NARRATIVE

SDG No:	JC36372	Laboratory:	Accutest, New Jersey
Analysis:	SW846-8270D	Number of Samples:	7
Location:	BMSMC, Humacao, PR		

SUMMARY: Seven (7) samples were analyzed for selected SVOCs following method SW846-8270D and selected PAHs were also analyzed by SW846-8270D using the selective ion monitoring (SIM) technique. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. Semivolatile Data Validation. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings:

1. Initial and continuing calibration verifications meet the method and guidance document required performance criteria except in the cases described in the Data Review Worksheet. Results for were qualified as estimated (J or UJ) in affected samples.

No closing calibration verification included in data package. No action taken, professional judgment.

QC samples were not validated.

2. MS/MSD % recovery and RPD within laboratory control limits except for the cases described in the Data Review Worksheet. Results qualified as estimated (J or UJ) in sample JC36372-4 (SIM).

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: February 18, 2017

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC36372-1
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	77	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	190	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	190	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	190	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	190	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	190	ug/kg	1	-	U	Yes
2-Methylphenol	77	ug/kg	1	-	U	Yes
3&4-Methylphenol	77	ug/kg	1	-	U	Yes
2-Nitrophenol	190	ug/kg	1	-	U	Yes
4-Nitrophenol	390	ug/kg	1	-	U	Yes
Pentachlorophenol	150	ug/kg	1	-	U	Yes
Phenol	77	ug/kg	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	190	ug/kg	1	-	UJ	Yes
2,4,5-Trichlorophenol	190	ug/kg	1	-	UJ	Yes
2,4,6-Trichlorophenol	190	ug/kg	1	-	U	Yes
Acenaphthene	48.4	ug/kg	1	-	-	Yes
Acenaphthylene	39	ug/kg	1	-	U	Yes
Acetophenone	190	ug/kg	1	-	U	Yes
Anthracene	144	ug/kg	1	-	-	Yes
Atrazine	77	ug/kg	1	-	U	Yes
Benzo(a)anthracene	628	ug/kg	1	-	-	Yes
Benzo(a)pyrene	632	ug/kg	1	-	-	Yes
Benzo(b)fluoranthene	857	ug/kg	1	-	-	Yes
Benzo(g,h,i)perylene	557	ug/kg	1	-	-	Yes
Benzo(k)fluoranthene	278	ug/kg	1	-	-	Yes
4-Bromophenyl phenyl ether	77	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	77	ug/kg	1	-	U	Yes
1,1'-Biphenyl	77	ug/kg	1	-	U	Yes
Benzaldehyde	31.6	ug/kg	1	J	J	Yes
2-Chloronaphthalene	77	ug/kg	1	-	U	Yes
4-Chloroaniline	190	ug/kg	1	-	U	Yes
Carbazole	85.9	ug/kg	1	-	-	Yes
Caprolactam	77	ug/kg	1	-	U	Yes
Chrysene	620	ug/kg	1	-	-	Yes
bis(2-Chloroethoxy)methane	77	ug/kg	1	-	U	Yes

bis(2-Chloroethyl)ether	77	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	77	ug/kg	1	-	U	Yes
4-Chlorophenyl phenyl ether	77	ug/kg	1	-	U	Yes
2,4-Dinitrotoluene	39	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	39	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	77	ug/kg	1	-	U	Yes
1,4-Dioxane	39	ug/kg	1	-	U	Yes
Dibenzofuran	77	ug/kg	1	J	J	Yes
Di-n-butyl phthalate	77	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	77	ug/kg	1	-	U	Yes
Diethyl phthalate	77	ug/kg	1	-	U	Yes
Dimethyl phthalate	77	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	77	ug/kg	1	-	U	Yes
Fluoranthene	1250	ug/kg	1	-	-	Yes
Fluorene	34.6	ug/kg	1	J	J	Yes
Hexachlorobenzene	77	ug/kg	1	-	U	Yes
Hexachlorobutadiene	39	ug/kg	1	-	UJ	Yes
Hexachlorocyclopentadiene	390	ug/kg	1	-	U	Yes
Hexachloroethane	190	ug/kg	1	-	UJ	Yes
Indeno(1,2,3-cd)pyrene	556	ug/kg	1	-	-	Yes
Isophorone	77	ug/kg	1	-	U	Yes
1-Methylnaphthalene	77	ug/kg	1	-	U	Yes
2-Methylnaphthalene	77	ug/kg	1	-	U	Yes
2-Nitroaniline	190	ug/kg	1	-	U	Yes
3-Nitroaniline	190	ug/kg	1	-	U	Yes
4-Nitroaniline	190	ug/kg	1	-	UJ	Yes
Naphthalene	129	ug/kg	1	-	-	Yes
Nitrobenzene	77	ug/kg	1	-	U	Yes
N-Nitroso-di-n-propylamine	77	ug/kg	1	-	U	Yes
Nitrosodiphenylamine	77	ug/kg	1	-	U	Yes
Phenanthrene	661	ug/kg	1	-	U	Yes
Pyrene	1200	ug/kg	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	190	ug/kg	1	-	U	Yes
METHOD: 8270D (SIM)						
Dibenzo(a,h)anthracene	93.2	ug/kg	1	-	-	Yes

Sample ID: JC36372-2
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	83	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	210	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	210	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	210	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	210	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	210	ug/kg	1	-	U	Yes
2-Methylphenol	83	ug/kg	1	-	U	Yes
3&4-Methylphenol	83	ug/kg	1	-	U	Yes
2-Nitrophenol	210	ug/kg	1	-	U	Yes
4-Nitrophenol	420	ug/kg	1	-	U	Yes
Pentachlorophenol	170	ug/kg	1	-	U	Yes
Phenol	83	ug/kg	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	210	ug/kg	1	-	UJ	Yes
2,4,5-Trichlorophenol	210	ug/kg	1	-	UJ	Yes
2,4,6-Trichlorophenol	210	ug/kg	1	-	U	Yes
Acenaphthene	42	ug/kg	1	-	U	Yes
Acenaphthylene	42	ug/kg	1	-	U	Yes
Acetophenone	210	ug/kg	1	-	U	Yes
Anthracene	42	ug/kg	1	-	U	Yes
Atrazine	83	ug/kg	1	-	U	Yes
Benzo(a)anthracene	58.2	ug/kg	1	-	-	Yes
Benzo(b)fluoranthene	77.4	ug/kg	1	-	-	Yes
Benzo(g,h,i)perylene	38.3	ug/kg	1	J	J	Yes
Benzo(k)fluoranthene	42	ug/kg	1	-	-	Yes
4-Bromophenyl phenyl ether	83	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	83	ug/kg	1	-	U	Yes
1,1'-Biphenyl	83	ug/kg	1	-	U	Yes
Benzaldehyde	52.4	ug/kg	1	J	J	Yes
2-Chloronaphthalene	83	ug/kg	1	-	U	Yes
4-Chloroaniline	210	ug/kg	1	-	U	Yes
Carbazole	83	ug/kg	1	-	U	Yes
Caprolactam	83	ug/kg	1	-	U	Yes
Chrysene	88.2	ug/kg	1	-	-	Yes
bis(2-Chloroethoxy)methane	83	ug/kg	1	-	U	Yes
bis(2-Chloroethyl)ether	83	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	83	ug/kg	1	-	U	Yes
4-Chlorophenyl phenyl ether	83	ug/kg	1	-	U	Yes

2,4-Dinitrotoluene	42	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	42	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	83	ug/kg	1	-	U	Yes
1,4-Dioxane	42	ug/kg	1	-	U	Yes
Dibenzofuran	83	ug/kg	1	-	U	Yes
Di-n-butyl phthalate	83	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	83	ug/kg	1	-	U	Yes
Diethyl phthalate	83	ug/kg	1	-	U	Yes
Dimethyl phthalate	83	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	83	ug/kg	1	-	U	Yes
Fluoranthene	113	ug/kg	1	-	-	Yes
Fluorene	42	ug/kg	1	-	U	Yes
Hexachlorobenzene	83	ug/kg	1	-	U	Yes
Hexachlorobutadiene	42	ug/kg	1	-	UJ	Yes
Hexachlorocyclopentadiene	420	ug/kg	1	-	U	Yes
Hexachloroethane	210	ug/kg	1	-	UJ	Yes
Indeno(1,2,3-cd)pyrene	37.1	ug/kg	1	J	J	Yes
Isophorone	83	ug/kg	1	-	U	Yes
1-Methylnaphthalene	18.7	ug/kg	1	J	J	Yes
2-Methylnaphthalene	17.8	ug/kg	1	J	J	Yes
2-Nitroaniline	210	ug/kg	1	-	U	Yes
3-Nitroaniline	210	ug/kg	1	-	U	Yes
4-Nitroaniline	210	ug/kg	1	-	UJ	Yes
Naphthalene	27.2	ug/kg	1	J	J	Yes
Nitrobenzene	83	ug/kg	1	-	U	Yes
N-Nitroso-di-n-propylamine	83	ug/kg	1	-	U	Yes
Nitrosodiphenylamine	83	ug/kg	1	-	U	Yes
Phenanthrene	63.1	ug/kg	1	-	U	Yes
Pyrene	91.8	ug/kg	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	210	ug/kg	1	-	U	Yes

METHOD: 8270D (SIM)

Benzo(a)pyrene	39.1	ug/kg	1	-	-	Yes
Dibenzo(a,h)anthracene	7.85	ug/kg	1	-	-	Yes

Sample ID: JC36372-4
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	77	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	190	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	190	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	190	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	190	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	190	ug/kg	1	-	U	Yes
2-Methylphenol	77	ug/kg	1	-	U	Yes
3&4-Methylphenol	77	ug/kg	1	-	U	Yes
2-Nitrophenol	190	ug/kg	1	-	U	Yes
4-Nitrophenol	390	ug/kg	1	-	U	Yes
Pentachlorophenol	150	ug/kg	1	-	U	Yes
Phenol	77	ug/kg	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	190	ug/kg	1	-	UJ	Yes
2,4,5-Trichlorophenol	190	ug/kg	1	-	UJ	Yes
2,4,6-Trichlorophenol	190	ug/kg	1	-	U	Yes
Acenaphthene	36.6	ug/kg	1	J	J	Yes
Acenaphthylene	38	ug/kg	1	-	U	Yes
Acetophenone	18.9	ug/kg	1	J	J	Yes
Anthracene	57.8	ug/kg	1	-	-	Yes
Atrazine	77	ug/kg	1	-	U	Yes
Benzo(a)anthracene	161	ug/kg	1	-	-	Yes
Benzo(b)fluoranthene	216	ug/kg	1	-	-	Yes
Benzo(g,h,i)perylene	104	ug/kg	1	-	-	Yes
Benzo(k)fluoranthene	62.4	ug/kg	1	-	-	Yes
4-Bromophenyl phenyl ether	77	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	77	ug/kg	1	-	U	Yes
1,1'-Biphenyl	77	ug/kg	1	-	U	Yes
Benzaldehyde	47.9	ug/kg	1	J	J	Yes
2-Chloronaphthalene	77	ug/kg	1	-	U	Yes
4-Chloroaniline	190	ug/kg	1	-	U	Yes
Carbazole	41.6	ug/kg	1	J	J	Yes
Caprolactam	77	ug/kg	1	-	U	Yes
Chrysene	168	ug/kg	1	-	-	Yes
bis(2-Chloroethoxy)methane	77	ug/kg	1	-	U	Yes
bis(2-Chloroethyl)ether	77	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	77	ug/kg	1	-	U	Yes
4-Chlorophenyl phenyl ether	77	ug/kg	1	-	U	Yes

2,4-Dinitrotoluene	39	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	39	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	77	ug/kg	1	-	U	Yes
1,4-Dioxane	39	ug/kg	1	-	U	Yes
Dibenzofuran	21.8	ug/kg	1	J	J	Yes
Di-n-butyl phthalate	77	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	77	ug/kg	1	-	U	Yes
Diethyl phthalate	77	ug/kg	1	-	U	Yes
Dimethyl phthalate	77	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	77	ug/kg	1	-	U	Yes
Fluoranthene	397	ug/kg	1	-	-	Yes
Fluorene	22.4	ug/kg	1	J	J	Yes
Hexachlorobenzene	77	ug/kg	1	-	U	Yes
Hexachlorobutadiene	39	ug/kg	1	-	UJ	Yes
Hexachlorocyclopentadiene	390	ug/kg	1	-	U	Yes
Hexachloroethane	190	ug/kg	1	-	UJ	Yes
Indeno(1,2,3-cd)pyrene	107	ug/kg	1	-	-	Yes
Isophorone	77	ug/kg	1	-	U	Yes
1-Methylnaphthalene	77	ug/kg	1	-	U	Yes
2-Methylnaphthalene	77	ug/kg	1	-	U	Yes
2-Nitroaniline	190	ug/kg	1	-	U	Yes
3-Nitroaniline	190	ug/kg	1	-	U	Yes
4-Nitroaniline	190	ug/kg	1	-	UJ	Yes
Naphthalene	129	ug/kg	1	-	-	Yes
Nitrobenzene	77	ug/kg	1	-	U	Yes
N-Nitroso-di-n-propylamine	77	ug/kg	1	-	U	Yes
Nitrosodiphenylamine	77	ug/kg	1	-	U	Yes
Phenanthrene	292	ug/kg	1	-	U	Yes
Pyrene	319	ug/kg	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	190	ug/kg	1	-	U	Yes
METHOD: 8270D (SIM)						
Benzo(a)pyrene	135	ug/kg	1	-	J	Yes
Dibenzo(a,h)anthracene	23.2	ug/kg	1	-	J	Yes

Sample ID: JC36372-5
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: AQ - Field Blank Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.6	ug/l	1	-	U	Yes
4-Chloro-3-methyl phenol	5.6	ug/l	1	-	U	Yes
2,4-Dichlorophenol	2.2	ug/l	1	-	U	Yes
2,4-Dimethylphenol	5.6	ug/l	1	-	U	Yes
2,4-Dinitrophenol	11	ug/l	1	-	U	Yes
4,6-Dinitro-o-cresol	5.6	ug/l	1	-	U	Yes
2-Methylphenol	2.2	ug/l	1	-	U	Yes
3&4-Methylphenol	2.2	ug/l	1	-	U	Yes
2-Nitrophenol	5.6	ug/l	1	-	U	Yes
4-Nitrophenol	11	ug/l	1	-	U	Yes
Pentachlorophenol	4.4	ug/l	1	-	U	Yes
Phenol	2.2	ug/l	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.6	ug/l	1	-	U	Yes
2,4,5-Trichlorophenol	5.6	ug/l	1	-	U	Yes
2,4,6-Trichlorophenol	5.6	ug/l	1	-	U	Yes
Acenaphthene	1.1	ug/l	1	-	U	Yes
Acenaphthylene	1.1	ug/l	1	-	U	Yes
Acetophenone	2.2	ug/l	1	-	U	Yes
Anthracene	1.1	ug/l	1	-	U	Yes
Atrazine	2.2	ug/l	1	-	UJ	Yes
Benzaldehyde	5.6	ug/l	1	-	U	Yes
Benzo(a)anthracene	1.1	ug/l	1	-	U	Yes
Benzo(a)pyrene	1.1	ug/l	1	-	U	Yes
Benzo(b)fluoranthene	1.1	ug/l	1	-	U	Yes
Benzo(g,h,i)perylene	1.1	ug/l	1	-	U	Yes
Benzo(k)fluoranthene	1.1	ug/l	1	-	U	Yes
4-Bromophenyl phenyl ether	1.1	ug/l	1	-	U	Yes
Butyl benzyl phthalate	2.2	ug/l	1	-	U	Yes
1,1'-Biphenyl	1.1	ug/l	1	-	U	Yes
2-Chloronaphthalene	2.2	ug/l	1	-	U	Yes
4-Chloroaniline	5.6	ug/l	1	-	U	Yes
Carbazole	1.1	ug/l	1	-	U	Yes
Caprolactam	2.2	ug/l	1	-	U	Yes
Chrysene	1.1	ug/l	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.2	ug/l	1	-	UJ	Yes
bis(2-Chloroethyl)ether	2.2	ug/l	1	-	U	Yes
bis(2-Chloroisopropyl)ether	2.2	ug/l	1	-	U	Yes

4-Chlorophenyl phenyl ether	2.2	ug/l	1	-	UJ	Yes
2,4-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
2,6-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
3,3'-Dichlorobenzidine	2.2	ug/l	1	-	U	Yes
1,4-Dioxane	1.1	ug/l	1	-	U	Yes
Dibenzofuran	5.6	ug/l	1	-	U	Yes
Di-n-butyl phthalate	2.2	ug/l	1	-	U	Yes
Di-n-octyl phthalate	2.2	ug/l	1	-	U	Yes
Diethyl phthalate	2.2	ug/l	1	-	U	Yes
Dimethyl phthalate	2.2	ug/l	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.2	ug/l	1	-	UJ	Yes
Fluoranthene	1.1	ug/l	1	-	U	Yes
Fluorene	1.1	ug/l	1	-	U	Yes
Hexachlorobenzene	1.1	ug/l	1	-	U	Yes
Hexachlorobutadiene	1.1	ug/l	1	-	U	Yes
Hexachlorocyclopentadiene	11	ug/l	1	-	U	Yes
Hexachloroethane	2.2	ug/l	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.1	ug/l	1	-	U	Yes
Isophorone	2.2	ug/l	1	-	U	Yes
1-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Nitroaniline	5.6	ug/l	1	-	UJ	Yes
3-Nitroaniline	5.6	ug/l	1	-	U	Yes
4-Nitroaniline	5.6	ug/l	1	-	U	Yes
Naphthalene	1.1	ug/l	1	-	U	Yes
Nitrobenzene	2.2	ug/l	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.2	ug/l	1	-	U	Yes
Nitrosodiphenylamine	5.6	ug/l	1	-	U	Yes
Phenanthrene	1.1	ug/l	1	-	U	Yes
Pyrene	1.1	ug/l	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.2	ug/l	1	-	U	Yes
METHOD: 8270D (SIM)						
Benzo(a)pyrene	0.056	ug/l	1	-	U	Yes
Dibenzo(a,h)anthracene	0.11	ug/l	1	-	U	Yes

Sample ID: JC36372-6
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: AQ - Equipment Blank Water

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.6	ug/l	1	-	U	Yes
4-Chloro-3-methyl phenol	5.6	ug/l	1	-	U	Yes
2,4-Dichlorophenol	2.2	ug/l	1	-	U	Yes
2,4-Dimethylphenol	5.6	ug/l	1	-	U	Yes
2,4-Dinitrophenol	11	ug/l	1	-	U	Yes
4,6-Dinitro-o-cresol	5.6	ug/l	1	-	U	Yes
2-Methylphenol	2.2	ug/l	1	-	U	Yes
3&4-Methylphenol	2.2	ug/l	1	-	U	Yes
2-Nitrophenol	5.6	ug/l	1	-	U	Yes
4-Nitrophenol	11	ug/l	1	-	U	Yes
Pentachlorophenol	4.4	ug/l	1	-	U	Yes
Phenol	2.2	ug/l	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.6	ug/l	1	-	U	Yes
2,4,5-Trichlorophenol	5.6	ug/l	1	-	U	Yes
2,4,6-Trichlorophenol	5.6	ug/l	1	-	U	Yes
Acenaphthene	1.1	ug/l	1	-	U	Yes
Acenaphthylene	1.1	ug/l	1	-	U	Yes
Acetophenone	2.2	ug/l	1	-	U	Yes
Anthracene	1.1	ug/l	1	-	U	Yes
Atrazine	2.2	ug/l	1	-	UJ	Yes
Benzaldehyde	5.6	ug/l	1	-	U	Yes
Benzo(a)anthracene	1.1	ug/l	1	-	U	Yes
Benzo(a)pyrene	1.1	ug/l	1	-	U	Yes
Benzo(b)fluoranthene	1.1	ug/l	1	-	U	Yes
Benzo(g,h,i)perylene	1.1	ug/l	1	-	U	Yes
Benzo(k)fluoranthene	1.1	ug/l	1	-	U	Yes
4-Bromophenyl phenyl ether	1.1	ug/l	1	-	U	Yes
Butyl benzyl phthalate	2.2	ug/l	1	-	U	Yes
1,1'-Biphenyl	1.1	ug/l	1	-	U	Yes
2-Chloronaphthalene	2.2	ug/l	1	-	U	Yes
4-Chloroaniline	5.6	ug/l	1	-	U	Yes
Carbazole	1.1	ug/l	1	-	U	Yes
Caprolactam	2.2	ug/l	1	-	U	Yes
Chrysene	1.1	ug/l	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.2	ug/l	1	-	UJ	Yes
bis(2-Chloroethyl)ether	2.2	ug/l	1	-	U	Yes
bis(2-Chloroisopropyl)ether	2.2	ug/l	1	-	U	Yes

4-Chlorophenyl phenyl ether	2.2	ug/l	1	-	UJ	Yes
2,4-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
2,6-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
3,3'-Dichlorobenzidine	2.2	ug/l	1	-	U	Yes
1,4-Dioxane	1.1	ug/l	1	-	U	Yes
Dibenzofuran	5.6	ug/l	1	-	U	Yes
Di-n-butyl phthalate	2.2	ug/l	1	-	U	Yes
Di-n-octyl phthalate	2.2	ug/l	1	-	U	Yes
Diethyl phthalate	2.2	ug/l	1	-	U	Yes
Dimethyl phthalate	2.2	ug/l	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.2	ug/l	1	-	UJ	Yes
Fluoranthene	1.1	ug/l	1	-	U	Yes
Fluorene	1.1	ug/l	1	-	U	Yes
Hexachlorobenzene	1.1	ug/l	1	-	U	Yes
Hexachlorobutadiene	1.1	ug/l	1	-	U	Yes
Hexachlorocyclopentadiene	11	ug/l	1	-	U	Yes
Hexachloroethane	2.2	ug/l	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.1	ug/l	1	-	U	Yes
Isophorone	2.2	ug/l	1	-	U	Yes
1-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Nitroaniline	5.6	ug/l	1	-	UJ	Yes
3-Nitroaniline	5.6	ug/l	1	-	U	Yes
4-Nitroaniline	5.6	ug/l	1	-	U	Yes
Naphthalene	1.1	ug/l	1	-	U	Yes
Nitrobenzene	1.1	ug/l	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.2	ug/l	1	-	U	Yes
Nitrosodiphenylamine	2.2	ug/l	1	-	U	Yes
Phenanthrene	1.1	ug/l	1	-	U	Yes
Pyrene	1.1	ug/l	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.2	ug/l	1	-	U	Yes
METHOD: 8270D (SIM)						
Benzo(a)pyrene	0.056	ug/kg	1	-	U	Yes
Dibenzo(a,h)anthracene	0.11	ug/kg	1	-	U	Yes

Sample ID: JC36372-4MS
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	1200	ug/kg	1	-	-	Yes
4-Chloro-3-methyl phenol	1420	ug/kg	1	-	-	Yes
2,4-Dichlorophenol	1450	ug/kg	1	-	-	Yes
2,4-Dimethylphenol	1190	ug/kg	1	-	-	Yes
2,4-Dinitrophenol	1950	ug/kg	1	-	-	Yes
4,6-Dinitro-o-cresol	1090	ug/kg	1	-	-	Yes
2-Methylphenol	1210	ug/kg	1	-	-	Yes
3&4-Methylphenol	1230	ug/kg	1	-	-	Yes
2-Nitrophenol	1540	ug/kg	1	-	-	Yes
4-Nitrophenol	1740	ug/kg	1	-	-	Yes
Pentachlorophenol	1850	ug/kg	1	-	-	Yes
Phenol	1240	ug/kg	1	-	-	Yes
2,3,4,6-Tetrachlorophenol	1430	ug/kg	1	-	-	Yes
2,4,5-Trichlorophenol	1470	ug/kg	1	-	-	Yes
2,4,6-Trichlorophenol	1460	ug/kg	1	-	-	Yes
Acenaphthene	1550	ug/kg	1	-	-	Yes
Acenaphthylene	1410	ug/kg	1	-	-	Yes
Acetophenone	1310	ug/kg	1	-	-	Yes
Anthracene	1480	ug/kg	1	-	-	Yes
Atrazine	1440	ug/kg	1	-	-	Yes
Benzo(a)anthracene	1670	ug/kg	1	-	-	Yes
Benzo(a)pyrene	1590	ug/kg	1	-	-	Yes
Benzo(b)fluoranthene	1590	ug/kg	1	-	-	Yes
Benzo(g,h,i)perylene	1700	ug/kg	1	-	-	Yes
Benzo(k)fluoranthene	1440	ug/kg	1	-	-	Yes
4-Bromophenyl phenyl ether	1570	ug/kg	1	-	-	Yes
Butyl benzyl phthalate	1610	ug/kg	1	-	-	Yes
1,1'-Biphenyl	1490	ug/kg	1	-	-	Yes
Benzaldehyde	1180	ug/kg	1	-	-	Yes
2-Chloronaphthalene	1520	ug/kg	1	-	-	Yes
4-Chloroaniline	602	ug/kg	1	-	-	Yes
Carbazole	1450	ug/kg	1	-	-	Yes
Caprolactam	1160	ug/kg	1	-	-	Yes
Chrysene	1660	ug/kg	1	-	-	Yes
bis(2-Chloroethoxy)methane	1460	ug/kg	1	-	-	Yes
bis(2-Chloroethyl)ether	1420	ug/kg	1	-	-	Yes
bis(2-Chloroisopropyl)ether	1310	ug/kg	1	-	-	Yes

4-Chlorophenyl phenyl ether	1500	ug/kg	1	-	-	Yes
2,4-Dinitrotoluene	1730	ug/kg	1	-	-	Yes
2,6-Dinitrotoluene	1670	ug/kg	1	-	-	Yes
3,3'-Dichlorobenzidine	678	ug/kg	1	-	-	Yes
1,4-Dioxane	555	ug/kg	1	-	-	Yes
Dibenzofuran	1480	ug/kg	1	-	-	Yes
Di-n-butyl phthalate	1380	ug/kg	1	-	-	Yes
Di-n-octyl phthalate	1350	ug/kg	1	-	-	Yes
Diethyl phthalate	1470	ug/kg	1	-	-	Yes
Dimethyl phthalate	1500	ug/kg	1	-	-	Yes
bis(2-Ethylhexyl)phthalate	1840	ug/kg	1	-	-	Yes
Fluoranthene	1780	ug/kg	1	-	-	Yes
Fluorene	1480	ug/kg	1	-	-	Yes
Hexachlorobenzene	1500	ug/kg	1	-	-	Yes
Hexachlorobutadiene	1430	ug/kg	1	-	-	Yes
Hexachlorocyclopentadiene	486	ug/kg	1	-	-	Yes
Hexachloroethane	986	ug/kg	1	-	-	Yes
Indeno(1,2,3-cd)pyrene	1920	ug/kg	1	-	-	Yes
Isophorone	1370	ug/kg	1	-	-	Yes
1-Methylnaphthalene	1350	ug/kg	1	-	-	Yes
2-Methylnaphthalene	1450	ug/kg	1	-	-	Yes
2-Nitroaniline	1630	ug/kg	1	-	-	Yes
3-Nitroaniline	1090	ug/kg	1	-	-	Yes
4-Nitroaniline	1040	ug/kg	1	-	-	Yes
Naphthalene	1350	ug/kg	1	-	-	Yes
Nitrobenzene	1400	ug/kg	1	-	-	Yes
N-Nitroso-di-n-propylamine	1260	ug/kg	1	-	-	Yes
Nitrosodiphenylamine	1500	ug/kg	1	-	-	Yes
Phenanthrene	1740	ug/kg	1	-	-	Yes
Pyrene	1880	ug/kg	1	-	-	Yes
1,2,4,5-Tetrachlorobenzene	1680	ug/kg	1	-	-	Yes
		METHOD: 8270D (SIM)				
Benzo(a)pyrene	220	ug/kg	1	-	-	Yes
Dibenzo(a,h)anthracene	59.9	ug/kg	1	-	-	Yes

Sample ID: JC36372-4MS
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: AQ - Equipment Blank Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	1120	ug/kg	1	-	-	Yes
4-Chloro-3-methyl phenol	1270	ug/kg	1	-	-	Yes
2,4-Dichlorophenol	1300	ug/kg	1	-	-	Yes
2,4-Dimethylphenol	1050	ug/kg	1	-	-	Yes
2,4-Dinitrophenol	1440	ug/kg	1	-	-	Yes
4,6-Dinitro-o-cresol	798	ug/kg	1	-	-	Yes
2-Methylphenol	1120	ug/kg	1	-	-	Yes
3&4-Methylphenol	1140	ug/kg	1	-	-	Yes
2-Nitrophenol	1460	ug/kg	1	-	-	Yes
4-Nitrophenol	1500	ug/kg	1	-	-	Yes
Pentachlorophenol	1570	ug/kg	1	-	-	Yes
Phenol	1150	ug/kg	1	-	-	Yes
2,3,4,6-Tetrachlorophenol	1250	ug/kg	1	-	-	Yes
2,4,5-Trichlorophenol	1290	ug/kg	1	-	-	Yes
2,4,6-Trichlorophenol	1310	ug/kg	1	-	-	Yes
Acenaphthene	1370	ug/kg	1	-	-	Yes
Acenaphthylene	1270	ug/kg	1	-	-	Yes
Acetophenone	1260	ug/kg	1	-	-	Yes
Anthracene	1340	ug/kg	1	-	-	Yes
Atrazine	1310	ug/kg	1	-	-	Yes
Benzo(a)anthracene	1420	ug/kg	1	-	-	Yes
Benzo(a)pyrene	1410	ug/kg	1	-	-	Yes
Benzo(b)fluoranthene	1420	ug/kg	1	-	-	Yes
Benzo(g,h,i)perylene	1550	ug/kg	1	-	-	Yes
Benzo(k)fluoranthene	1310	ug/kg	1	-	-	Yes
4-Bromophenyl phenyl ether	1380	ug/kg	1	-	-	Yes
Butyl benzyl phthalate	1400	ug/kg	1	-	-	Yes
1,1'-Biphenyl	1350	ug/kg	1	-	-	Yes
Benzaldehyde	1210	ug/kg	1	-	-	Yes
2-Chloronaphthalene	1390	ug/kg	1	-	-	Yes
4-Chloroaniline	453	ug/kg	1	-	-	Yes
Carbazole	1300	ug/kg	1	-	-	Yes
Caprolactam	1010	ug/kg	1	-	-	Yes
Chrysene	1430	ug/kg	1	-	-	Yes
bis(2-Chloroethoxy)methane	1330	ug/kg	1	-	-	Yes
bis(2-Chloroethyl)ether	1410	ug/kg	1	-	-	Yes
bis(2-Chloroisopropyl)ether	1280	ug/kg	1	-	-	Yes

4-Chlorophenyl phenyl ether	1340	ug/kg	1	-	-	Yes
2,4-Dinitrotoluene	1550	ug/kg	1	-	-	Yes
2,6-Dinitrotoluene	1490	ug/kg	1	-	-	Yes
3,3'-Dichlorobenzidine	667	ug/kg	1	-	-	Yes
1,4-Dioxane	751	ug/kg	1	-	-	Yes
Dibenzofuran	1320	ug/kg	1	-	-	Yes
Di-n-butyl phthalate	1260	ug/kg	1	-	-	Yes
Di-n-octyl phthalate	1230	ug/kg	1	-	-	Yes
Diethyl phthalate	1300	ug/kg	1	-	-	Yes
Dimethyl phthalate	1340	ug/kg	1	-	-	Yes
bis(2-Ethylhexyl)phthalate	1380	ug/kg	1	-	-	Yes
Fluoranthene	1590	ug/kg	1	-	-	Yes
Fluorene	1300	ug/kg	1	-	-	Yes
Hexachlorobenzene	1360	ug/kg	1	-	-	Yes
Hexachlorobutadiene	1360	ug/kg	1	-	-	Yes
Hexachlorocyclopentadiene	375	ug/kg	1	-	-	Yes
Hexachloroethane	915	ug/kg	1	-	-	Yes
Indeno(1,2,3-cd)pyrene	1720	ug/kg	1	-	-	Yes
Isophorone	1250	ug/kg	1	-	-	Yes
1-Methylnaphthalene	1210	ug/kg	1	-	-	Yes
2-Methylnaphthalene	1330	ug/kg	1	-	-	Yes
2-Nitroaniline	1380	ug/kg	1	-	-	Yes
3-Nitroaniline	897	ug/kg	1	-	-	Yes
4-Nitroaniline	939	ug/kg	1	-	-	Yes
Naphthalene	1330	ug/kg	1	-	-	Yes
Nitrobenzene	1330	ug/kg	1	-	-	Yes
N-Nitroso-di-n-propylamine	1200	ug/kg	1	-	-	Yes
Nitrosodiphenylamine	1370	ug/kg	1	-	-	Yes
Phenanthrene	1520	ug/kg	1	-	-	Yes
Pyrene	1610	ug/kg	1	-	-	Yes
1,2,4,5-Tetrachlorobenzene	1500	ug/kg	1	-	-	Yes
METHOD: 8270D (SIM)						
Benzo(a)pyrene	564	ug/kg	1	-	-	Yes
Dibenzo(a,h)anthracene	118	ug/kg	1	-	-	Yes

DATA REVIEW WORKSHEETS

Project Number:_JC36372_____
Date:_____January_26,_2017_____
Shipping Date:__January_26,_2017_____
EPA Region:_____2_____

REVIEW OF SEMIVOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for SVOCs included:

Lab. Project/SDG No.: ____JC36372_____ Sample matrix: ____Soil___
No. of Samples: _____7_SIM/7_SCAN_____

Trip blank No.: _____-_____
Field blank No.: _____JC36372-5_____
Equipment blank No.:_____JC36372-6_____
Field duplicate No.:_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

_Overall Comments:_SVOCs_TCL_special_list_analyzed_by_method_SW846-8270D;_Selected_PAHs_analyzed_by_method_SW846-8270D_(SIM)_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:___February_18,_2017_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	pH	ACTION
All samples extracted and analyzed within method recommended holding time. Sample preservation appropriate.				

Cooler temperature (Criteria: 4 ± 2 °C): _____3.6°C_____

Actions

Results will be qualified based on the criteria of the following Table:

Table 1. Holding Time Actions for Semivolatile Analyses

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤ 7 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 7 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 7 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 7 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R
Non-Aqueous	No	≤ 14 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 14 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 14 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 14 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R

All criteria were met __X__
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

_X__ The DFTPP performance results were reviewed and found to be within the specified criteria.

_X__ DFTPP tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

Notes: These requirements do not apply when samples are analyzed by the Selected Ion Monitoring (SIM) technique.

All mass spectrometer conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortion are unacceptable

Notes: No data should be qualified based of DFTPP failure.

The requirement to analyze the instrument performance check solution is optional when analysis of PAHs/pentachlorophenol is to be performed by the SIM technique.

List the samples affected:

_____

_____

_____

_____

Actions:

1. If sample are analyzed without a preceding valid instrument performance check or are analyzed 12 hours after the Instrument Performance Check, qualify all data in those samples as unusable (R).
2. If ion abundance criteria are not met, use professional judgment to determine to what extent the data may be utilized.
3. State in the Data Review Narrative, decisions to use analytical data associated with DFTPP instrument performance checks not meeting the contract requirements.
4. Use professional judgment to determine if associated data should be qualified based on the spectrum of the mass calibration compounds.

All criteria were met ___X___
Criteria were not met
and/or see below _____

INITIAL CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:___01/10-11/17_(SCAN)_____ _____12/14/16_(SIM)_____
Instrument ID numbers:_____GCMS2P_____ _____GCMS4M_____
Matrix/Level:_____Aqueous/low_____ _____Aqueous/low_____

Date of initial calibration:___01/10/167_(SIM)_____ _____02/07/17_(SCAN)_____
Instrument ID numbers:_____GCMS4P_____ _____GCMS6P_____
Matrix/Level:_____Aqueous/low_____ _____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and initial calibration verification meets the method and guidance validation document performance criteria.				

Note: Instruments GCMS3M; GCMS6P (02/01/17); and GCMSZ were also employed for running QC samples for this data packages. QC samples not validated.

Actions:

Qualify the initial calibration analytes listed in Table 2 using the following criteria:

Table 3. Initial Calibration Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Initial Calibration not performed at specified frequency and sequence	Use professional judgment R	Use professional judgment R
Initial Calibration not performed at the specified concentrations	J	UJ
RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J+ or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%RSD > Maximum %RSD in Table 2 for target analyte	J	Use professional judgment
%RSD ≤ Maximum %RSD in Table 2 for target analyte	No qualification	No qualification

Initial Calibration

Table 2. RRF, %RSD, and %D Acceptance Criteria in Initial Calibration and CCV for Semivolatil Analysis

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
1,4-Dioxane	0.010	40.0	± 40.0	± 50.0
Benzaldehyde	0.100	40.0	± 40.0	± 50.0
Phenol	0.080	20.0	± 20.0	± 25.0
Bis(2-chloroethyl)ether	0.100	20.0	± 20.0	± 25.0
2-Chlorophenol	0.200	20.0	± 20.0	± 25.0
2-Methylphenol	0.010	20.0	± 20.0	± 25.0
3-Methylphenol	0.010	20.0	± 20.0	± 25.0
2,2'-Oxybis-(1-chloropropane)	0.010	20.0	± 25.0	± 50.0
Acetophenone	0.060	20.0	± 20.0	± 25.0
4-Methylphenol	0.010	20.0	± 20.0	± 25.0
N-Nitroso-di-n-propylamine	0.080	20.0	± 25.0	± 25.0
Hexachloroethane	0.100	20.0	± 20.0	± 25.0
Nitrobenzene	0.090	20.0	± 20.0	± 25.0
Isophorone	0.100	20.0	± 20.0	± 25.0
2-Nitrophenol	0.060	20.0	± 20.0	± 25.0
2,4-Dimethylphenol	0.050	20.0	± 25.0	± 50.0
Bis(2-chloroethoxy)methane	0.080	20.0	± 20.0	± 25.0
2,4-Dichlorophenol	0.060	20.0	± 20.0	± 25.0
Naphthalene	0.200	20.0	± 20.0	± 25.0
4-Chloroaniline	0.010	40.0	± 40.0	± 50.0
Hexachlorobutadiene	0.040	20.0	± 20.0	± 25.0
Caprolactam	0.010	40.0	± 30.0	± 50.0
4-Chloro-3-methylphenol	0.040	20.0	± 20.0	± 25.0
2-Methylnaphthalene	0.100	20.0	± 20.0	± 25.0
Hexachlorocyclopentadiene	0.010	40.0	± 40.0	± 50.0
2,4,6-Trichlorophenol	0.090	20.0	± 20.0	± 25.0
2,4,5-Trichlorophenol	0.100	20.0	± 20.0	± 25.0
1,1'-Biphenyl	0.200	20.0	± 20.0	± 25.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
2-Chloronaphthalene	0.300	20.0	± 20.0	± 25.0
2-Nitroaniline	0.060	20.0	± 25.0	± 25.0
Dimethylphthalate	0.300	20.0	± 25.0	± 25.0
2,6-Dinitrotoluene	0.080	20.0	± 20.0	± 25.0
Acenaphthylene	0.400	20.0	± 20.0	± 25.0
3-Nitroaniline	0.010	20.0	± 25.0	± 50.0
Acenaphthene	0.200	20.0	± 20.0	± 25.0
2,4-Dinitrophenol	0.010	40.0	± 50.0	± 50.0
4-Nitrophenol	0.010	40.0	± 40.0	± 50.0
Dibenzofuran	0.300	20.0	± 20.0	± 25.0
2,4-Dinitrotoluene	0.070	20.0	± 20.0	± 25.0
Diethylphthalate	0.300	20.0	± 20.0	± 25.0
1,2,4,5-Tetrachlorobenzene	0.100	20.0	± 20.0	± 25.0
4-Chlorophenyl-phenylether	0.100	20.0	± 20.0	± 25.0
Fluorene	0.200	20.0	± 20.0	± 25.0
4-Nitroaniline	0.010	40.0	± 40.0	± 50.0
4,6-Dinitro-2-methylphenol	0.010	40.0	± 30.0	± 50.0
4-Bromophenyl-phenyl ether	0.070	20.0	± 20.0	± 25.0
N-Nitrosodiphenylamine	0.100	20.0	± 20.0	± 25.0
Hexachlorobenzene	0.050	20.0	± 20.0	± 25.0
Atrazine	0.010	40.0	± 25.0	± 50.0
Pentachlorophenol	0.010	40.0	± 40.0	± 50.0
Phenanthrene	0.200	20.0	± 20.0	± 25.0
Anthracene	0.200	20.0	± 20.0	± 25.0
Carbazole	0.050	20.0	± 20.0	± 25.0
Di-n-butylphthalate	0.500	20.0	± 20.0	± 25.0
Fluoranthene	0.100	20.0	± 20.0	± 25.0
Pyrene	0.400	20.0	± 25.0	± 50.0
Butylbenzylphthalate	0.100	20.0	± 25.0	± 50.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
3,3'-Dichlorobenzidine	0.010	40.0	± 40.0	± 50.0
Benzo(a)anthracene	0.300	20.0	± 20.0	± 25.0
Chrysene	0.200	20.0	± 20.0	± 50.0
Bis(2-ethylhexyl) phthalate	0.200	20.0	± 25.0	± 50.0
Di-n-octylphthalate	0.010	40.0	± 40.0	± 50.0
Benzo(b)fluoranthene	0.010	20.0	± 25.0	± 50.0
Benzo(k)fluoranthene	0.010	20.0	± 25.0	± 50.0
Benzo(a)pyrene	0.010	20.0	± 20.0	± 50.0
Indeno(1,2,3-cd)pyrene	0.010	20.0	± 25.0	± 50.0
Dibenzo(a,h)anthracene	0.010	20.0	± 25.0	± 50.0
Benzo(g,h,i)perylene	0.010	20.0	± 30.0	± 50.0
2,3,4,6-Tetrachlorophenol	0.040	20.0	± 20.0	± 50.0
Naphthalene	0.600	20.0	± 25.0	± 25.0
2-Methylnaphthalene	0.300	20.0	± 20.0	± 25.0
Acenaphthylene	0.900	20.0	± 20.0	± 25.0
Acenaphthene	0.500	20.0	± 20.0	± 25.0
Fluorene	0.700	20.0	± 25.0	± 50.0
Phenanthrene	0.300	20.0	± 25.0	± 50.0
Anthracene	0.400	20.0	± 25.0	± 50.0
Fluoranthene	0.400	20.0	± 25.0	± 50.0
Pyrene	0.500	20.0	± 30.0	± 50.0
Benzo(a)anthracene	0.400	20.0	± 25.0	± 50.0
Chyrsene	0.400	20.0	± 25.0	± 50.0
Benzo(b)fluoranthene	0.100	20.0	± 30.0	± 50.0
Benzo(k)fluoranthene	0.100	20.0	± 30.0	± 50.0
Benzo(a)pyrene	0.100	20.0	± 25.0	± 50.0
Indeno(1,2,3-cd)pyrene	0.100	20.0	± 40.0	± 50.0
Dibenzo(a,h)anthracene	0.010	25.0	± 40.0	± 50.0
Benzo(g,h,i)perylene	0.020	25.0	± 40.0	± 50.0

Pentachlorophenol	0.010	40.0	±50.0	±50.0
Deuterated Monitoring Compounds				

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Closing Maximum %D
1,4-Dioxane-d_8	0.010	20.0	±25.0	±50.0
Phenol-d_5	0.010	20.0	±25.0	±25.0
Bis-(2-chloroethyl)ether-d_8	0.100	20.0	±20.0	±25.0
2-Chlorophenol-d_4	0.200	20.0	±20.0	±25.0
4-Methylphenol-d_8	0.010	20.0	±20.0	±25.0
4-Chloroaniline-d_4	0.010	40.0	±40.0	±50.0
Nitrobenzene-d_5	0.050	20.0	±20.0	±25.0
2-Nitrophenol-d_4	0.050	20.0	±20.0	±25.0
2,4-Dichlorophenol-d_3	0.060	20.0	±20.0	±25.0
Dimethylphthalate-d_6	0.300	20.0	±20.0	±25.0
Acenaphthylene-d_8	0.400	20.0	±20.0	±25.0
4-Nitrophenol-d_4	0.010	40.0	±40.0	±50.0
Fluorene-d_{10}	0.100	20.0	±20.0	±25.0
4,6-Dinitro-2-methylphenol-d_2	0.010	40.0	±30.0	±50.0
Anthracene-d_{10}	0.300	20.0	±20.0	±25.0
Pyrene-d_{10}	0.300	20.0	±25.0	±50.0
Benzo(a)pyrene-d_{12}	0.010	20.0	±20.0	±50.0
Fluoranthene-d_{10} (SIM)	0.400	20.0	±25.0	±50.0
2-Methylnaphthalene-d_{10} (SIM)	0.300	20.0	±20.0	±25.0

[1] If a closing CCV is acting as an opening CCV, all target analytes must meet the requirements for an opening CCV.

Note: If analysis by SIM technique is requested for PAH/pentachlorophenols, calibration standards analyzed at 0.10, 0.20, 0.40, 0.80, and 1.0 ng/uL for each target compound of interest and the associated DMCs. Pentachlorophenol will require only a four point initial calibration at 0.20, 0.40, 0.80, and 1.0 ng/uL.

All criteria were met _____
Criteria were not met
and/or see below ____X____

CONTINUING CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	01/10-11/17_(SCAN)	12/14/16_(SIM)
Date of initial calibration verification (ICV):	01/11/17	12/14/16; 12/19/16
Date of continuing calibration verification (CCV):	02/01/17	01/30/17; 02/02/17
Date of closing CCV:	-	-
Instrument ID numbers:	GCMS2P	GCMS4M
Matrix/Level:	Aqueous/low	Aqueous/low
Date of initial calibration:	02/07/17_(SCAN)	01/10/17_(SIM)
Date of initial calibration verification (ICV):	02/07/17	01/11/17
Date of continuing calibration verification (CCV):	02/08/17	01/31/17; 02/01/17
Date of closing CCV:	-	-
Instrument ID numbers:	GCMS6P	GCMS4P
Matrix/Level:	Aqueous/low	Aqueous/low

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
GCMS2P				
02/01/17	cc2898-25	30.6	1,4-dioxane*	JC36372-5; -6
		24.3	n-Nitroso-di-n-propylamine*	
		22.7	bis(2-chloroethoxy)methane	
		-44.8	2-nitroaniline	
		-21.1	2,4-dinitrophenol*	
		-28.1	4-chlorophenyl-phenyl ether	
		-26.2	4,6-dinitro-methylphenol*	
		24.5	Butylbenzylphthalate*	
		29.6	bis(2-ethylhexyl)phthalate	
02/01/17	cc2899-25	-42.0	Atrazine	
GCMS6P				
02/01/17	cc1572-50	-26.8	Hexachloroethane	JC36372-1; -2; -4
		28.0	Caprolactam*	
		-41.4	Hexachlorobutadiene	
		-20.1	2,4,5-trichlorophenol	
		-23.2	2,3,4,6-tetrachlorophenol	
		20.2	4-nitroaniline	

Note: Initial and continuing calibration verifications meet the method and guidance document required performance criteria except for the cases described in this document. Results qualified as estimated (J or UJ) in affected samples.

* % difference outside was method performance criteria but within the guidance document performance criteria. No action taken.

No action taken for QC samples.

No closing calibration verification included in data package. No action taken, professional judgment.

Actions:

Notes: Verify that the CCV is run at the required frequency (an opening and closing CCV must be run within 12-hour period).

All DMCs must meet the RRF values given in Table 2. No qualification of the data is necessary on DMCs RRF and %RSD/%D alone. Use professional judgment to evaluate DMCs and %RSD/%D data in conjunction with DMCs recoveries to determine the need for qualification of the data.

Qualify the initial calibration analytes listed in Table 2 using the following criteria in the CCVs:

Table 4. CCV Actions for Semivolatile Analysis

Criteria for Opening CCV	Criteria for Closing CCV	Action	
		Detect	Non-detect
CCV not performed at required frequency and sequence	CCV not performed at required frequency	Use professional judgment R	Use professional judgment R
CCV not performed at specified concentration	CCV not performed at specified concentration	Use professional judgment	Use professional judgment
RRF < Minimum RRF in Table 2 for target analyte	RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	RRF ≥ Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%D outside the Opening Maximum %D limits in Table 2 for target analyte	%D outside the Closing Maximum %D limits in Table 2 for target analyte	J	UJ
%D within the inclusive Opening Maximum %D limits in Table 2 for target analyte	%D within the inclusive Closing Maximum %D limits in Table 2 for target analyte	No qualification	No qualification

All criteria were met ___X___
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Notes: The concentration of non-target compounds in all blanks must be less than or equal to 10 ug/L.

The concentration of target compounds in all blanks must be less than its CRQL listed in the method.

Samples taken from a drinking water tap do not have and associated field blank.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_____	_____	_____	_____	_____
_No_target_analytes_detected_in_method_blanks_____				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_target_analytes_detected_in_the_field/equipment_blanks_analyzed_with_this_data_package._____				

Note:

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Qualify samples based on the criteria summarized in Table 5:

Table 5. Blank and TCLP/SPLP LEB Actions for Semivolatile Analysis

Blank Type	Blank Result	Sample Result	Action
Method, TCLP/SPLP LEB, Field	Detect	Non-detect	No qualification
	< CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		≥ CRQL	Use professional judgment
	≥ CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		≥ CRQL but < Blank Result	Report at sample results and qualify as non-detect (U) or as unusable (R)
		≥ CRQL and ≥ Blank Result	Use professional judgment
	Grossly high	Detect	Report at sample results and qualify as unusable (R)
	TIC > 5.0 ug/L (water) or 0.0050 mg/L (TCLP leachate) or TIC > 170 ug/Kg (soil)	Detect	Use professional judgment

List samples qualified

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES – DEUTERATED MONITORING COMPOUNDS (DMCs)

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries – deuterated monitoring compounds. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

Notes: Recoveries for DMCs in samples and blanks must be within the limits specified in Table 6.

The recovery limits for any of the compounds listed in Table 6 may be expanded at any time during the period of performance if USEPA determines that the limits are too restrictive.

If a DMC is not added in the samples and blanks or the concentrations of DMCs in the samples and blank not the specified, use professional judgment in qualifying the data.

Table 7. DMC Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
%R < 10% (excluding DMCs with 10% as a lower acceptance limit)	J-	R
10% ≤ %R (excluding DMCs with 10% as a lower acceptance limit) < Lower Acceptance Limit	J-	UJ
Lower Acceptance limit ≤ %R ≤ Upper Acceptance Limit	No qualification	No qualification
%R > Upper Acceptance Limit	J+	No qualification

List the percent recoveries (%Rs) which do not meet the criteria for DMCs (surrogate) recovery.

Matrix:___Soil_____

SAMPLE ID	SURROGATE COMPOUND	ACTION

_DMCs_meet_the_required_criteria_in_all_samples_analyzed._Non-_deuterated_surrogates_added_
_to_the_samples_and_were_within_laboratory_recovery_limits._____

Note:

Table 8. Semivolatile DMCs and the Associated Target Analytes

1,4–Dioxane-d_8 (DMC-1)	**Phenol-d_5 (DMC-2)**	**Bis(2-Chloroethyl) ether-d_8 (DMC-3)**
1,4-Dioxane	Benzaldehyde Phenol	Bis(2-chloroethyl)ether 2,2'-Oxybis(1-chloropropane) Bis(2-chloroethoxy)methane
2-Chlorophenol-d_4 (DMC-4)	**4-Methylphenol-d_8 (DMC-5)**	**4-Chloroaniline-d_4 (DMC-6)**
2-Chlorophenol	2-Methylphenol 3-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	4-Chloroaniline Hexachlorocyclopentadiene Dichlorobenzidine
Nitrobenzene-d_5 (DMC-7)	**2-Nitrophenol-d_4 (DMC-8)**	**2,4-Dichlorophenol-d_3 (DMC-9)**
Acetophenone N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 2,6-Dinitrotoluene 2,4-Dinitrotoluene N-Nitrosodiphenylamine	Isophorone 2-Nitrophenol	2,4-Dichlorophenol Hexachlorobutadiene Hexachlorocyclopentadiene 4-Chloro-3-methylphenol 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 1,2,4,5-Tetrachlorobenzene *Pentachlorophenol 2,3,4,6-Tetrachlorophenol
Dimethylphthalate-d_6 (DMC-10)	**Acenaphthylene-d_8 (DMC-11)**	**4-Nitrophenol-d_4 (DMC-12)**
Caprolactam 1,1'-Biphenyl Dimethylphthalate Diethylphthalate Di-n-butylphthalate Butylbenzylphthalate Bis(2-ethylhexyl) phthalate Di-n-octylphthalate	*Naphthalene *2-Methylnaphthalene 2-Chloronaphthalene *Acenaphthylene *Acenaphthene	2-Nitroaniline 3-Nitroaniline 2,4-Dinitrophenol 4-Nitrophenol 4-Nitroaniline

Fluorene-d_{10} (DMC-13)	**4,6-Dinitro-2-methylphenol-d_2 (DMC-14)**	**Anthracene-d_{10} (DMC-15)**
Dibenzofuran *Fluorene 4-Chlorophenyl-phenylether 4-Bromophenyl-phenylether Carbazole	4,6-Dinitro-2-methylphenol	Hexachlorobenzene Atrazine *Phenanthrene *Anthracene
Pyrene-d_{10} (DMC-16)	**Benzo(a)pyrene-d_{12} (DMC-17)**	
*Fluoranthene *Pyrene *Benzo(a)anthracene *Chrysene	3,3'-Dichlorobenzidine *Benzo(b)fluoranthene *Benzo(k)fluoranthene *Benzo(a)pyrene *Indeno(1,2,3-cd)pyrene *Dibenzo(a,h)anthracene *Benzo(g,h,i)perylene	

*Included in optional Target Analyte List (TAL) of PAHs and PCP only.

Table 9. Semivolatile SIM DMCs and the Associated Target Analytes

Fluoranthene-d10 (DMC-1)	**2-Methylnaphthalene-d10 (DMC-2)**
Fluoranthene	Naphthalene
Pyrene	2-Methylnaphthalene
Benzo(a)anthracene	Acenaphthylene
Chrysene	Acenaphthene
Benzo(b)fluoranthene	Fluorene
Benzo(k)fluoranthene	Pentachlorophenol
Benzo(a)pyrene	Phenanthrene
Indeno(1,2,3-cd)pyrene	Anthracene
Dibenzo(a,h)anthracene	
Benzo(g,h,i)perylene	

All criteria were met _____
Criteria were not met
and/or see below ____X__

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

NOTES: Data for MS and MSDs will not be present unless requested by the Region. Notify the Contract Laboratory COR if a field or trip blank was used for the MS and MSD.

For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:_____JC36372-4_____ Matrix/Level:_____Soil_____
Sample ID:_____JC36342-4_(SIM)_____ Matrix/Level:_____Soil_____
Sample ID:_____JC36371-1_____ Matrix/Level:___Aqueous___
Sample ID:_____JC36371-1_(SIM)_____ Matrix/Level:___Aqueous___

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM
JC36372-1, JC36372-2, JC36372-4

Compound	JC36372-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
Benzo(a)pyrene	135		37.9	220	224* a	37.8	564	1134* a	88* b	18-188/44
Dibenzo(a,h) anthracene	23.2		37.9	59.9	97	37.8	118	251* a	65* b	28-169/41

(a) Outside of in house control limits due to possible sample nonhomogeneity.
(b) Analytical precision exceeds in-house control limits.
* - outside laboratory control limits

Note: MS/MSD % recovery and RPD within laboratory control limits except for the cases described in this document. Results qualified as estimated (J or UJ) in sample JC36372-4 (SIM).

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION
Internal area meets the required criteria for batch samples corresponding to this data package.					

Action:

1. If an internal standard area count for a sample or blank is greater than 213.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration) (see Table 10 below):
   a. Qualify detects for compounds quantitated using that internal standard as estimated low (J-).
   b. Do not qualify non-detected associated compounds.
2. If an internal standard area count for a sample or blank is less than 20.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration):
   a. Qualify detects for compounds quantitated using that internal standard as estimated high (J+).
   b. Qualify non-detected associated compounds as unusable (R).
3. If an internal standard area count for a sample or blank is greater than or equal to 50.0%, and less than or equal to 213% of the area for the associated standard opening CCV or mid-point standard from initial calibration, no qualification of the data is necessary.
4. If an internal standard RT varies by more than 10.0 seconds: Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.
5. If an internal standard RT varies by less than or equal to 10.0 seconds, no qualification of the data is necessary.

Note: Inform the Contract Laboratory Program Project Officer (CLP PO) if the internal standard performance criteria are grossly exceeded. Note in the Data Review Narrative potential effects on the data resulting from unacceptable internal standard performance.

State in the Data Review Narrative if the required internal standard compounds are not added to a sample or blank or if the required internal standard compound is not analyzed at the specified concentration.

Actions:

Table 10. Internal Standard Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Area response < 20% of the opening CCV or mid-point standard CS3 from ICAL	J+	R
20% ≤ Area response < 50% of the opening CCV or mid-point standard CS3 from ICAL	J+	UJ
50% ≤ Area response ≤ 200% of the opening CCV or mid-point standard CS3 from ICAL	No qualification	No qualification
Area response > 200% of the opening CCV or mid-point standard CS3 from ICAL	J-	No qualification
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL > 10.0 seconds	R	R
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL < 10.0 seconds	No qualification	No qualification

All criteria were met __X__
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

Criteria:

Is the Relative Retention Times (RRTs) of reported compounds within ±0.06 RRT units of the standard RRT [opening Continuing Calibration Verification (CCV) or mid-point standard from the initial calibration]. **Yes?** or No?

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions

Mass spectra of the sample compound and a current laboratory-generated standard [i.e., the mass spectrum from the associated calibration standard (opening CCV or mid-point standard from initial calibration)] must match according to the following criteria:

a. All ions present in the standard mass spectrum at a relative intensity greater than 10% must be present in the sample spectrum.
b. The relative intensities of these ions must agree within ±20% between the standard and sample spectra (e.g., for an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30-70%).
c. Ions present at greater than 10% in the sample mass spectrum, but not present in the standard spectrum, must be evaluated by a reviewer experienced in mass spectral interpretation.

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
_Identified_compounds_meet_the_required_criteria____		

Action:

1. The application of qualitative criteria for GC/MS analysis of target compounds requires professional judgment. It is up to the reviewer's discretion to obtain additional information from the laboratory. If it is determined that incorrect identifications were made, qualify all such data as unusable (R).

2. Use professional judgment to qualify the data if it is determined that cross-contamination has occurred.

3. Note in the Data Review Narrative any changes made to the reported compounds or concerns regarding target compound identifications. Note, for Contract Laboratory COR action, the necessity for numerous or significant changes.

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

NOTE: Tentatively identified compounds should only be evaluated when requested by a party from outside of the Hazardous Waste Support Section (HWSS).

List TICs

Sample ID	Compound	Sample ID	Compound

Action:

1. Qualify all TIC results for which there is presumptive evidence of a match (e.g. greater than or equal to 85% match) as tentatively identified (NJ), with approximated concentrations. TICs labeled "unknown" are qualified as estimated (J).
2. General actions related to the review of TIC results are as follows:
   a. If it is determined that a tentative identification of a non-target compound is unacceptable, change the tentative identification to "unknown" or another appropriate identification, and qualify the result as estimated (J).
   b. If all contractually-required peaks were not library searched and quantitated, the Region's designated representative may request these data from the laboratory.
3. In deciding whether a library search result for a TIC represents a reasonable identification, use professional judgment. If there is more than one possible match, report the result as "either compound X or compound Y". If there is a lack of isomer specificity, change the TIC result to a nonspecific isomer result (e.g., 1,3,5-trimethyl benzene to trimethyl benzene isomer) or to a compound class (e.g., 2-methyl, 3-ethyl benzene to a substituted aromatic compound).
4. The reviewer may elect to report all similar compounds as a total (e.g., all alkanes may be summarized and reported as total hydrocarbons).

5. Target compounds from other fractions and suspected laboratory contaminants should be marked as "non-reportable".
6. Other Case factors may influence TIC judgments. If a sample TIC match is poor, but other samples have a TIC with a valid library match, similar RRT, and the same ions, infer identification information from the other sample TIC results.
7. Note in the Data Review Narrative any changes made to the reported data or any concerns regarding TIC identifications.
8. Note, for Contract Laboratory COR action, failure to properly evaluate and report TICs

All criteria were met __X__
Criteria were not met
and/or see below _____

SAMPLE QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

Action:

1. When a sample is analyzed at more than one dilution, the lower CRQL are used unless a QC exceedance dictates the use of higher CRQLs from the diluted sample. Samples reported with an "E" qualifier should be reported from the diluted sample.
2. If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.
3. For non-aqueous samples, if the solids is less than 10.0%, use professional judgment for both detects and non-detects. If the percent solid for a soil sample is greater than or equal to 10.0% and less than 30.0%, use professional judgment to qualify detects and non-detects. If the percent solid for a soil sample is greater than or equal to 30.0%, detects and non-detects should not be qualified (see Table 11).
4. Note, for Contract Laboratory COR action, numerous or significant failures to accurately quantify the target compounds or to properly evaluate and adjust CRQLs.
5. Results between MDL and CRQL should be qualified as estimated "J".
6. Results < MDL should be reported at the CRQL and qualified "U". MDLs themselves should not be reported.

Table 11. Percent Solids Actions for Semivolatile Analysis for Non-Aqueous Samples

Criteria	Action	
	Detects	Non-detects
%Solids < 10.0%	Use professional judgment	Use professional judgment
10.0% ≤ %Solids ≤ 30.0%	Use professional judgment	Use professional judgment
%Solids > 30.0%	No qualification	No qualification

SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Sample ID:__ JC36372-1_____ Analyte:__Chrysene __ RF:_1.185_

[ ] = (491575)(40)/(1034286)(1.185)
= 16.04 ppm Ok

QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

All criteria were met __N/A___
Criteria were not met
and/or see below _____

FIELD DUPLICATE PRECISION

Sample IDs:_____-_____ Matrix:_____-_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: if large RPD (> 50 %) is observed, confirm identification of the samples and note differences. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL ug/L	SAMPLE CONC. (ug/l)	DUPLICATE CONC. (ug/l)	RPD	ACTION
No field/laboratory duplicate analyzed as part of this data package. MS/MSD % recovery RPD used to assess precision. RPD within the required guidance document criteria < 50 % for detected target analytes above 5 SQL except for the cases described in this document.					

All criteria were met __X__
Criteria were not met
and/or see below _____

OTHER ISSUES

A. System Performance

List samples qualified based on the degradation of system performance during simple analysis:

Sample ID	Comments	Actions

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Inform the Contract Laboratory Program COR any action as a result of degradation of system performance which significantly affected the data.

B. Overall Assessment of Data

List samples qualified based on other issues:

Sample ID	Comments	Actions
_No_other_issues_that_required_the_need_to_qualify_the_data._Results_are_valid_and_can_be_used_for_decission_purposes._Other_discrepancies_are_shown_below._____		

Note: The acid surrogate standard not added to the LCS analyzed on 12/28/16. The affected samples either was not re-extracted because no sample was left or extracted outside the method recommended holding time. No action taken, professional judgment.

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Inform the Contract Laboratory COR the action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of

the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

3. Sometimes, due to dilutions, re-analysis or SIM/Scan runs are being performed, there will be multiple results for a single analyte from a single sample. The following criteria and professional judgment are used to determine which result should be reported:
    - The analysis with the lower CRQL
    - The analysis with the better QC results
    - The analysis with the higher results

EXECUTIVE NARRATIVE

SDG No:	**JC36372**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8015C**	Number of Samples:	**8**
Location:	BMSMC, Humacao, PR		

SUMMARY: Eight (8) samples were analyzed for the low molecular weight alcohols (LMWAs) list following method SW846-8015C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings: **1.** MS/MSD % recovery and RPD within laboratory control limits except for the cases described in the Data Review Worksheet. RPD for ethanol, isopropyl alcohol, and methanol outside the laboratory control limits. No qualification made based on RPD results, professional judgment.

No MS/MSD samples analyzed for the aqueous matrix. BS/BSD used to assess accuracy.

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Rafael Infante

Signature:
Date: February 18, 2017

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC36372-1
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	120	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	120	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
Methanol	230	ug/kg	1.0	-	U	Yes

Sample ID: JC36372-2
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	120	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	120	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
Methanol	240	ug/kg	1.0	-	U	Yes

Sample ID: JC36372-3
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	120	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	120	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
Methanol	250	ug/kg	1.0	-	U	Yes

Sample ID: JC36372-4
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	120	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	120	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
Methanol	230	ug/kg	1.0	-	U	Yes

Sample ID: JC36372-5
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: AQ - Field Blank Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC36372-6
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: AQ - Equipment Blank

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC36372-4MS
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	6290	ug/kg	1.0	-	-	Yes
Isobutyl Alcohol	6650	ug/kg	1.0	-	-	Yes
Isopropyl Alcohol	6580	ug/kg	1.0	-	-	Yes
n-Propyl Alcohol	6490	ug/kg	1.0	-	-	Yes
n-Butyl Alcohol	6730	ug/kg	1.0	-	-	Yes
sec-Butyl Alcohol	7450	ug/kg	1.0	-	-	Yes
Methanol	6430	ug/kg	1.0	-	-	Yes

Sample ID: JC36372-4MSD
Sample location: BMSMC, Humacao, PR
Sampling date: 1/26/2017
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	4730	ug/kg	1.0	-	-	Yes
Isobutyl Alcohol	5550	ug/kg	1.0	-	-	Yes
Isopropyl Alcohol	4730	ug/kg	1.0	-	-	Yes
n-Propyl Alcohol	7660	ug/kg	1.0	-	-	Yes
n-Butyl Alcohol	6190	ug/kg	1.0	-	-	Yes
sec-Butyl Alcohol	6690	ug/kg	1.0	-	-	Yes
Methanol	3890	ug/kg	1.0	-	-	Yes

DATA REVIEW WORKSHEETS

Project Number:___JC36372_____
Date:_____01/26/2017_____
Shipping Date:____01/26/2017_____
EPA Region:_____2_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.
The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The modified data review for VOCs included:

Lab. Project/SDG No.: __JC36372_____ Sample matrix: ____Soil_____
No. of Samples: _____8_____

Trip blank No.: _____-_____
Field blank No.: _____JC36372-5_____
Equipment blank No.:___JC36372-6_____
Field duplicate No.:_____JC36372-2/JC36372-3_____

___X___ Data Completeness
___X___ Holding Times
___N/A_ GC/MS Tuning
___N/A_ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Low_molecular_weight_alcohols_by_SW-846_8015C._____
_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__February_18,_2017_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding. All samples properly preserved.				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 3.6°C

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __N/A__
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__N/A_ The BFB performance results were reviewed and found to be within the specified criteria.

__N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X__
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____10/10/16_____
Dates of continuing calibration:_____01/30/17_____
Dates of final calibration verification:___10/10/10;_01/30/17_____
Instrument ID number:_____GCGH_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED

Note: Initial, continuing, and final calibration verifications meets method specific criteria in at least one of the two columns. Final calibration verification included in data packages.

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r < 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method_blank_meeth_method_specific_criteria				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_No_target_analytes_detected_in_the_field/equipment_blanks_analyzed_with_this_data_package._____
_No_trip_blank_analyzed_with_this_data_package._____

All criteria were met __X__
Criteria were not met
and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met ___X___
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	Hexanol	~~DBFM~~	~~TOL-d8~~	~~BFB~~	
	S1 a	S1 b			
JC36372-5	111	94			
JC36372-6	115	102			
GGH5639-BS	102	102			
GGH5639-BSD	102	105			
GGH5639-MB1	99	111			
JC36372-1	95	93			
JC36372-2	85	87			
JC36372-3	101	104			
JC36372-4	76	71			
GGH5640-BS	100	94			
GGH5640-MB1	96	92			
JC36372-4MS	112	109			
JC36372-4MSD	93	94			

(a) Recovery from GC signal #2 (b) Recovery from GC signal #1

Note: All surrogate recoveries within laboratory control limits.

QC Limits* (Aqueous)
_____LL_to_UL___ _56_to_145_ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ _52_to_141__ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4
DBFM = Dibromofluoromethane
TOL-d8 = Toluene-d8
BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met ___X____
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC36372-4MS/-4MSD_____ Matrix/Level:____Soil/low_____

MS OR MSD COMPOUND % R RPD QC LIMITS ACTION

MS/MSD%_recoveries_and_RPD_within_laboratory_control_limits_except_for_the_cases_described_in_this_document._____

Note: RPD for ethanol, isopropyl alcohol, and methanol outside the laboratory control limits. No qualification made based on RPD results, professional judgment.

No MS/MSD samples analyzed for the aqueous matrix. BS/BSD used to assess accuracy.

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All criteria were met __X__
Criteria were not met
and/or see below ____

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____-_____ Matrix/Level/Unit:_____-_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? **Yes** or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

LCS ID COMPOUND % R QC LIMIT

___Recoveries_within_laboratory_control_limits._____
_____
_____
_____

Note:

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met ___X__
Criteria were not met
and/or see below _____

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs:__JC36372-2/JC36372-3___ Matrix:___Soil_____

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Field duplicates analyzed with this data package. RPD within laboratory, generally acceptable and guidance document performance criteria control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __N/A__
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC36372-4MS

Sec-Butyl alcohol RF = 26.42

[ ] = (193044)/(26.42)

= 7,307 ppb OK

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B. Percent Solids

List samples which have ≤ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)

EXECUTIVE NARRATIVE

SDG No:	**JC36372**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8081B**	Number of Samples:	**8**

Location: BMSMC, Humacao, PR

SUMMARY: Eight (8) samples were analyzed for the TCL pesticides list following method SW846-8081B. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings:

1. Initial and initial calibration verification within the guidance document performance criteria. Continuing calibration % differences meet the performance criteria in at least one of the two columns. Final calibration verification not included in data package. No action taken.

2. MS/MSD % recoveries and RPD within laboratory control limits except for the cases described in the Data Review Worksheet. Results for Aldrin qualified as estimated (J) in sample JC36372-4. No qualifications made based on RPD results, professional judgment.

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: February 18, 2017

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC36372-1
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.76	ug/kg	1	-	U	Yes
alpha-BHC	0.76	ug/kg	1	-	U	Yes
beta-BHC	0.76	ug/kg	1	-	U	Yes
delta-BHC	0.76	ug/kg	1	-	U	Yes
gamma-BHC (Lindane)	0.76	ug/kg	1	-	U	Yes
alpha-Chlordane	0.76	ug/kg	1	-	U	Yes
gamma-Chlordane	0.76	ug/kg	1	-	U	Yes
Dieldrin	0.76	ug/kg	1	-	U	Yes
4,4'-DDD	0.76	ug/kg	1	-	U	Yes
4,4'-DDE	0.76	ug/kg	1	-	U	Yes
4,4'-DDT	0.76	ug/kg	1	-	U	Yes
Endrin	0.76	ug/kg	1	-	U	Yes
Endosulfan sulfate	0.76	ug/kg	1	-	U	Yes
Endrin aldehyde	0.76	ug/kg	1	-	U	Yes
Endosulfan-I	0.76	ug/kg	1	-	U	Yes
Endosulfan-II	0.76	ug/kg	1	-	U	Yes
Heptachlor	0.76	ug/kg	1	-	U	Yes
Heptachlor epoxide	0.76	ug/kg	1	-	U	Yes
Methoxychlor	1.5	ug/kg	1	-	U	Yes
Endrin ketone	0.76	ug/kg	1	-	U	Yes
Toxaphene	19	ug/kg	1	-	U	Yes

Sample ID: JC36372-2
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.84	ug/kg	1	-	U	Yes
alpha-BHC	0.84	ug/kg	1	-	U	Yes
beta-BHC	0.84	ug/kg	1	-	U	Yes
delta-BHC	0.84	ug/kg	1	-	U	Yes
gamma-BHC (Lindane)	0.84	ug/kg	1	-	U	Yes
alpha-Chlordane	0.84	ug/kg	1	-	U	Yes
gamma-Chlordane	0.84	ug/kg	1	-	U	Yes
Dieldrin	0.84	ug/kg	1	-	U	Yes
4,4'-DDD	0.84	ug/kg	1	-	U	Yes
4,4'-DDE	0.84	ug/kg	1	-	U	Yes
4,4'-DDT	0.84	ug/kg	1	-	U	Yes
Endrin	0.84	ug/kg	1	-	U	Yes
Endosulfan sulfate	0.84	ug/kg	1	-	U	Yes
Endrin aldehyde	0.84	ug/kg	1	-	U	Yes
Endosulfan-I	0.84	ug/kg	1	-	U	Yes
Endosulfan-II	0.84	ug/kg	1	-	U	Yes
Heptachlor	0.84	ug/kg	1	-	U	Yes
Heptachlor epoxide	0.84	ug/kg	1	-	U	Yes
Methoxychlor	1.7	ug/kg	1	-	U	Yes
Endrin ketone	0.84	ug/kg	1	-	U	Yes
Toxaphene	21	ug/kg	1	-	U	Yes

Sample ID: JC36372-3
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.84	ug/kg	1	-	U	Yes
alpha-BHC	0.84	ug/kg	1	-	U	Yes
beta-BHC	0.84	ug/kg	1	-	U	Yes
delta-BHC	0.84	ug/kg	1	-	U	Yes
gamma-BHC (Lindane)	0.84	ug/kg	1	-	U	Yes
alpha-Chlordane	0.84	ug/kg	1	-	U	Yes
gamma-Chlordane	0.84	ug/kg	1	-	U	Yes
Dieldrin	0.84	ug/kg	1	-	U	Yes
4,4'-DDD	0.84	ug/kg	1	-	U	Yes
4,4'-DDE	0.84	ug/kg	1	-	U	Yes
4,4'-DDT	0.84	ug/kg	1	-	U	Yes
Endrin	0.84	ug/kg	1	-	U	Yes
Endosulfan sulfate	0.84	ug/kg	1	-	U	Yes
Endrin aldehyde	0.84	ug/kg	1	-	U	Yes
Endosulfan-I	0.84	ug/kg	1	-	U	Yes
Endosulfan-II	0.84	ug/kg	1	-	U	Yes
Heptachlor	0.84	ug/kg	1	-	U	Yes
Heptachlor epoxide	0.84	ug/kg	1	-	U	Yes
Methoxychlor	1.7	ug/kg	1	-	U	Yes
Endrin ketone	0.84	ug/kg	1	-	U	Yes
Toxaphene	21	ug/kg	1	-	U	Yes

Sample ID: JC36372-4
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.76	ug/kg	1	-	UJ	Yes
alpha-BHC	0.76	ug/kg	1	-	U	Yes
beta-BHC	0.76	ug/kg	1	-	U	Yes
delta-BHC	0.76	ug/kg	1	-	U	Yes
gamma-BHC (Lindane)	0.76	ug/kg	1	-	U	Yes
alpha-Chlordane	0.76	ug/kg	1	-	U	Yes
gamma-Chlordane	0.76	ug/kg	1	-	U	Yes
Dieldrin	0.76	ug/kg	1	-	U	Yes
4,4'-DDD	0.76	ug/kg	1	-	U	Yes
4,4'-DDE	0.76	ug/kg	1	-	U	Yes
4,4'-DDT	0.76	ug/kg	1	-	U	Yes
Endrin	0.76	ug/kg	1	-	U	Yes
Endosulfan sulfate	0.76	ug/kg	1	-	U	Yes
Endrin aldehyde	0.76	ug/kg	1	-	U	Yes
Endosulfan-I	0.76	ug/kg	1	-	U	Yes
Endosulfan-II	0.76	ug/kg	1	-	U	Yes
Heptachlor	0.76	ug/kg	1	-	U	Yes
Heptachlor epoxide	0.76	ug/kg	1	-	U	Yes
Methoxychlor	1.5	ug/kg	1	-	U	Yes
Endrin ketone	0.76	ug/kg	1	-	U	Yes
Toxaphene	19	ug/kg	1	-	U	Yes

Sample ID: JC36372-5
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: AQ - Field Blank Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.011	ug/l	1	-	U	Yes
alpha-BHC	0.011	ug/l	1	-	U	Yes
beta-BHC	0.011	ug/l	1	-	U	Yes
delta-BHC	0.011	ug/l	1	-	U	Yes
gamma-BHC (Lindane)	0.011	ug/l	1	-	U	Yes
alpha-Chlordane	0.011	ug/l	1	-	U	Yes
gamma-Chlordane	0.011	ug/l	1	-	U	Yes
Dieldrin	0.011	ug/l	1	-	U	Yes
4,4'-DDD	0.011	ug/l	1	-	U	Yes
4,4'-DDE	0.011	ug/l	1	-	U	Yes
4,4'-DDT	0.011	ug/l	1	-	U	Yes
Endrin	0.011	ug/l	1	-	U	Yes
Endosulfan sulfate	0.011	ug/l	1	-	U	Yes
Endrin aldehyde	0.011	ug/l	1	-	U	Yes
Endrin ketone	0.011	ug/l	1	-	U	Yes
Endosulfan-I	0.011	ug/l	1	-	U	Yes
Endosulfan-II	0.011	ug/l	1	-	U	Yes
Heptachlor	0.011	ug/l	1	-	U	Yes
Heptachlor epoxide	0.011	ug/l	1	-	U	Yes
Methoxychlor	0.022	ug/l	1	-	U	Yes
Toxaphene	0.27	ug/l	1	-	U	Yes

Sample ID: JC36372-6
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: AQ - Equipment Blank Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.011	ug/l	1	-	U	Yes
alpha-BHC	0.011	ug/l	1	-	U	Yes
beta-BHC	0.011	ug/l	1	-	U	Yes
delta-BHC	0.011	ug/l	1	-	U	Yes
gamma-BHC (Lindane)	0.011	ug/l	1	-	U	Yes
alpha-Chlordane	0.011	ug/l	1	-	U	Yes
gamma-Chlordane	0.011	ug/l	1	-	U	Yes
Dieldrin	0.011	ug/l	1	-	U	Yes
4,4'-DDD	0.011	ug/l	1	-	U	Yes
4,4'-DDE	0.011	ug/l	1	-	U	Yes
4,4'-DDT	0.011	ug/l	1	-	U	Yes
Endrin	0.011	ug/l	1	-	U	Yes
Endosulfan sulfate	0.011	ug/l	1	-	U	Yes
Endrin aldehyde	0.011	ug/l	1	-	U	Yes
Endrin ketone	0.011	ug/l	1	-	U	Yes
Endosulfan-I	0.011	ug/l	1	-	U	Yes
Endosulfan-II	0.011	ug/l	1	-	U	Yes
Heptachlor	0.011	ug/l	1	-	U	Yes
Heptachlor epoxide	0.011	ug/l	1	-	U	Yes
Methoxychlor	0.022	ug/l	1	-	U	Yes
Toxaphene	0.27	ug/l	1	-	U	Yes

Sample ID: JC36372-4MS
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	46.9	ug/kg	1	-	-	Yes
alpha-BHC	17.4	ug/kg	1	-	-	Yes
beta-BHC	9.0	ug/kg	1	-	-	Yes
delta-BHC	19.5	ug/kg	1	-	-	Yes
gamma-BHC (Lindane)	18.5	ug/kg	1	-	-	Yes
alpha-Chlordane	17.0	ug/kg	1	-	-	Yes
gamma-Chlordane	12.3	ug/kg	1	-	-	Yes
Dieldrin	16.9	ug/kg	1	-	-	Yes
4,4'-DDD	17.2	ug/kg	1	-	-	Yes
4,4'-DDE	12.9	ug/kg	1	-	-	Yes
4,4'-DDT	17.8	ug/kg	1	-	-	Yes
Endrin	22.6	ug/kg	1	-	-	Yes
Endosulfan sulfate	14.3	ug/kg	1	-	-	Yes
Endrin aldehyde	25.8	ug/kg	1	-	-	Yes
Endosulfan-I	16.3	ug/kg	1	-	-	Yes
Endosulfan-II	16.4	ug/kg	1	-	-	Yes
Heptachlor	19.9	ug/kg	1	-	-	Yes
Heptachlor epoxide	18.0	ug/kg	1	-	-	Yes
Methoxychlor	20.3	ug/kg	1	-	-	Yes
Endrin ketone	19.6	ug/kg	1	-	-	Yes
Toxaphene	ND	ug/kg	1	-	-	Yes

Sample ID: JC36372-4MSD
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	17.0	ug/kg	1	-	-	Yes
alpha-BHC	17.5	ug/kg	1	-	-	Yes
beta-BHC	16.9	ug/kg	1	-	-	Yes
delta-BHC	19.8	ug/kg	1	-	-	Yes
gamma-BHC (Lindane)	18.1	ug/kg	1	-	-	Yes
alpha-Chlordane	20.1	ug/kg	1	-	-	Yes
gamma-Chlordane	16.4	ug/kg	1	-	-	Yes
Dieldrin	17.7	ug/kg	1	-	-	Yes
4,4'-DDD	16.6	ug/kg	1	-	-	Yes
4,4'-DDE	16.4	ug/kg	1	-	-	Yes
4,4'-DDT	16.7	ug/kg	1	-	-	Yes
Endrin	21.2	ug/kg	1	-	-	Yes
Endosulfan sulfate	14.8	ug/kg	1	-	-	Yes
Endrin aldehyde	16.3	ug/kg	1	-	-	Yes
Endosulfan-I	16.7	ug/kg	1	-	-	Yes
Endosulfan-II	16.4	ug/kg	1	-	-	Yes
Heptachlor	19.7	ug/kg	1	-	-	Yes
Heptachlor epoxide	18.9	ug/kg	1	-	-	Yes
Methoxychlor	15.9	ug/kg	1	-	-	Yes
Endrin ketone	16.2	ug/kg	1	-	-	Yes
Toxaphene	ND	ug/kg	1	-	-	Yes

DATA REVIEW WORKSHEETS

Project/CasNumber:_____JC36372___
Sampling Date:_____01/26/2017_____
Shipping Date:_____01/26/17_____
EPA Region No.:_____2_____

REVIEW OF PESTICIDE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JC36372_____ Sample matrix: _____Soil_____
No. of Samples: _____8_____

Trip blank No.: _____-_____
Field blank No.: _____JC36372-5_____
Equipment blank No.:____JC36372-6_____
Field duplicate No.:_____JC36372-2/JC36372-3_____
Field spikes No.:_____JC36372-4MS/JC36372-4MSD_____
QC audit samples:_____-_____

___X___ Data Completeness
___X___ Holding Times
__N/A__ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
__X____ Laboratory Control Spikes
__X____ Field Duplicates
__X____ Calibrations
__X____ Compound Identifications
__X____ Compound Quantitation
__X____ Quantitation Limits

Overall Comments:__TCL_pesticides_list_by_SW846-8081B_____
_____
_____
_____
_____

Definition of Qualifiers:

J-	Estimated results	U-	Compound not detected
R-	Rejected data	UJ-	Estimated nondetect

Reviewer: Rafael Delaut
Date:__February_18,_2017_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	ACTION
Samples properly preserved. All samples extracted and analyzed within the required criteria.			

Note:

Criteria

Aqueous samples - seven (7) days from sample collection for extraction; 40 days from sample collection for analysis.
Non-aqueous samples – fourteen (14) days from sample collection for extraction; 40 days from sample collection for analysis.

Cooler temperature (Criteria: 4 ± 2 °C): 3.6°C - OK

Actions

Qualify aqueous sample results using preservation and technical holding time information as follows:

a. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed within the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).

b. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).

c. If the samples were properly preserved, and were extracted and analyzed within the technical holding times, no qualification of the data is necessary.

d. If the samples were properly preserved, and were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.

e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

Qualify non-aqueous sample results using preservation and technical holding time information as follows:
a. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed within the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).
b. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).
c. If the samples were properly preserved, and were extracted and analyzed within the technical holding time, no qualification of the data is necessary.
d. If the samples were properly preserved, and were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.
e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

All criteria were met ___X___
Criteria were not met see below _____

GAS CHROMATOGRAPH WITH ELECTRON CAPTURE DETECTOR (GC/ECD) INSTRUMENT PERFORMANCE CHECK (SECTIONS 1 TO 5)

1. Resolution Check Mixture

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? **Yes**? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 60.0%? Yes? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

2. Performance Evaluation Mixture (PEM) Resolution Criteria

Criteria

Is PEM analysis performed at the required frequency (at the end of each pesticide initial calibration sequence and every 12 hours)? **Yes**? or No?

Action

a. If PEM is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

Criteria

Is PEM % Resolution < 90%? Yes? or **No?**

Action

a. a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

All criteria were met ___X___
Criteria were not met see below _____

3. PEM 4,4'-DDT Breakdown

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is detected? Yes? or **No**?

Action

a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is not detected Yes? or **No**?

Action

a. Qualify non-detects for 4,4'- DDT as unusable (R)
b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

4. PEM Endrin Breakdown

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is detected? Yes? or **No**?

Action

a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is not detected Yes? or **No**?

Action

a. Qualify non-detects for Endrin as unusable (R)
b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
c. Qualify detects for Endrin ketone as tentatively identified (NJ)

All criteria were met ___X___
Criteria were not met see below _____

5. Mid-point Individual Standard Mixture Resolution -

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? **Yes**? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 90.0%? **Yes**? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

Criteria

Is mid-point individual standard mixture analysis performed at the required frequency (every 12 hours)? **Yes**? or No?

Action

a. If the mid-point individual standard mixture analysis is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

All criteria were met ___X___
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____01/23/17_____	_____11/15/16_____
Dates of initial calibration verification:_____01/23/17_____	_____11/15/16_____
Dates of continuing calibration:___02/01/17;_02/02/17;_02/07/17__	_____02/02/17_____
Dates of final calibration_____-_____	_____02/02/17_____
Instrument ID numbers:_____GC4G_____	_____GC8H_____
Matrix/Level:_____Aqueous/low_____	_____Aqueous/low____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED

Note: Initial and initial calibration verification within the guidance document performance criteria. Continuing calibration % differences meet the performance criteria in at least one of the two columns.

Final calibration verification not included in data package. No action taken.

Criteria

Are a five point calibration curve delivered with concentration levels as shown in Table 3 of SOP HW-36A, Revision 0, June, 2015? **Yes**? or No?

Actions

If the standard concentrations listed in Table 3 are not used, use professional judgment to evaluate the effect on the data

Criteria

Are RT Windows calculated correctly? **Yes**? or No?

Action

Recalculate the windows and use the corrected values for all evaluations.

Criteria

Are the Percent Relative Standard Deviation (%RSD) of the CFs for each of the single component target compounds less than or equal to 20.0%, except for alpha-BHC and delta-BHC?

Yes? or No?

All criteria were met __X__
Criteria were not met
and/or see below _____

Are the %RSD of the CFs for alpha-BHC and delta-BHC less than or equal to 25.0%. **Yes**? or No?

Is the %RSD of the CFs for each of the Toxaphene peaks must be < 30% when 5-point ICAL is performed? **Yes**? or No?

Is the %RSD of the CFs for the two surrogates (tetrachloro-m-xylene and decachlorobiphenyl) less than or equal to 30.0%. **Yes**? or No?

Action

a. If the %RSD criteria are not met, qualify detects as estimated (J) and use professional judgment to qualify non-detected target compounds.
b. If the %RSD criteria are within allowable limits, no qualification of the data is necessary

Continuing Calibration Checks

Criteria

Is the continuing calibration standard analyzed at the acceptable time intervals? **Yes**? or No?

Action

a. If more than 14 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of either a PEM or mid-point concentration of the Individual Standard Mixtures (A and B) or (C), qualify all data as unusable (R).
b. If more than 12 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of the last sample or blank that is part of the same analytical sequence, qualify all data as unusable (R).
c. If more than 72 hours has elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene Calibration Verification Standard (CS3), qualify all data as unusable (R).

Criteria

Is the Percent Difference (%D) within ±25.0% for the PEM sample? Yes? or **No**?

Action
a. Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

Criteria

For the Calibration Verification Standard (CS3); is the Percent Difference (%D) within ± 25.0%? Yes? or **No**?

Action

Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is detected? Yes? or **No**?

Action

a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)
b. Non-detected associated compounds are not qualified

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is not detected Yes? or **No**?

Action

a. Qualify non-detects for 4,4'- DDT as unusable (R)
b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is detected? Yes? or **No**?

Action

a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)
b. Non-detected associated compounds are not qualified

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is not detected Yes? or **No**?

Action

a. Qualify non-detects for Endrin as unusable (R)
b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
c. Qualify detects for Endrin ketone as tentatively identified (NJ)

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

CRQL concentration_____N/A_____

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No_target_analytes_detected_in_method_blanks_at_a_reporting_limit_of_0.01,_0.02,_and_0.25 ug/L				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No_target_anayte_detected_in_the_field/equipment_blanks_analyzed_with_this_data_package.				

All criteria were met __X__
Criteria were not met

and/or see below ____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

The concentration of non-target compounds in all blanks must be less than or equal to 10 µg/L. The concentration of each target compound found in the method or field blanks must be less than its CRQL listed in the method.

Data concerning the field blanks are not evaluated as part of the CCS process. If field blanks are present, the data reviewer should evaluate this data in a similar fashion as the method blanks.

Specific actions are as follows:

Blank Actions for Pesticide Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Sulfur Cleanup, Instrument, Field, TCLP/SPLP	Detects	Not detected	No qualification required
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and ≤ blank concentration	Report blank value for sample concentration with a U
		≥ CRQL and > blank concentration	No qualification required
	= CRQL	≤ CRQL	Report CRQL value with a U
		> CRQL	No qualification required
	Gross contamination	Detects	Report blank value for sample concentration with a U

All criteria were met __X__

Criteria were not met
and/or see below ____

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix:_Aqueous/Solid_____

Lab Sample ID	Lab File ID	S1 a	S1 b	S2 a	S2 b
JC36372-5	8G2635.D	90	89	56	48
JC36372-6	8G2636.D	86	85	45	38
OP233-BS1	8G2577.D	87	76	102	80
OP233-MB1	8G2576.D	88	81	71	61
OP233-MB1	4G77729.D	96	92	71	70
OP233-MS	8G2631.D	83	85	106	90
OP233-MSD	8G2632.D	85	85	102	87
JC36372-1	4G77547.D	84	78	130	86
JC36372-2	4G77548.D	88	81	128	80
JC36372-3	4G77549.D	89	82	126	87
JC36372-4	4G77550.D	84	78	118	73
OP215-BS1	4G77546.D	91	85	122	97
OP215-MB1	4G77545.D	88	81	125	92
OP215-MS	4G77551.D	83	76	112	78
OP215-MSD	4G77552.D	88	80	103	69

Surrogate Compounds	Recovery Limits (Aqueous)	Recovery limits (Solids)
S1 = Tetrachloro-m-xylene	13-153%	24-136 %
S2 = Decachlorobiphenyl	10-138%	10-153 %

(a) Recovery from GC signal #1
(b) Recovery from GC signal #2
(c) Outside control limits due to matrix interference with the internal standard.

Note: Surrogate recoveries were within laboratory control limits.

Actions:

a. For any surrogate recovery greater than 150%, qualify detected target compounds as biased high (J+).
b. Do not qualify non-detected target compounds for surrogate recovery > 150 %.
c. If both surrogate recoveries are greater than or equal to 30% and less than or equal to 150%, no qualification of the data is necessary.
d. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify detected target compounds as biased low (J-).
e. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify non-detected target compounds as approximated (UJ).
f. If low surrogate recoveries are from sample dilution, professional judgment should be used to determine if the resulting data should be qualified. If sample dilution is not a factor:

i. Qualify detected target compounds as biased low (J-).
ii. Qualify non-detected target compounds as unusable (R).

g. If surrogate RTs in PEMs, Individual Standard Mixtures, samples, and blanks are outside of the RT Windows, the reviewer must use professional judgment to qualify data.
h. If surrogate RTs are within RT windows, no qualification of the data is necessary.
i. If the two surrogates were not added to all samples, MS/MSDs, standards, LCSs, and blanks, use professional judgment in qualifying data as missing surrogate analyte may not directly apply to target analytes.

Summary Surrogate Actions for Pesticide Analyses

Criteria	Action*	
	Detected Target Compounds	Non-detected Target Compounds
%R > 150%	J+	No qualification
30% < %R < 150%	No qualification	
10% < %R < 30%	J-	UJ
%R < 10% (sample dilution not a factor)	J-	R
%R < 10% (sample dilution is a factor)	Use professional judgment	
RT out of RT window	Use professional judgment	
RT within RT window	No qualification	

* Use professional judgment in qualifying data, as surrogate recovery problems may not directly apply to target analytes.

All criteria were met_____
Criteria were not met
and/or see below ____X__

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

Data for MS and MSDs will not be present unless requested by the Region.
Notify the Contract Laboratory Program Project Officer (CLP PO) if a field blank was used for the MS and MSD, unless designated as such by the Region.

> **NOTE:** For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:____JC36372-4MS/MSD___ Matrix/Level:__Soil_____
Sample ID:____JC36371-2MS/MSD___ Matrix/Level:_Aqueous___

The QC reported here applies to the following samples: **Method:** SW846 8081B
JC36372-1, JC36372-2, JC36372-3, JC36372-4

Compound	JC36372-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
Aldrin	ND		19	46.9	247* a	19	17.0	90	94* a	23-143/44
beta-BHC	ND		19	9.0	47	19	16.9	89	61* a	7-143/48

(a) Outside the QC limits.
* Outside QC limits

Note: MS/MSD % recoveries and RPD within laboratory control limits except for the cases described in this document. Results for Aldrin qualified as estimated (J) in sample JC36372-4. No qualifications made based on RPD results, professional judgment.

Action

No qualification of the data is necessary on MS and MSD data alone. However, using professional judgment, the validator may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

LCS Spike Compound	Recovery Limits (%)
gamma-BHC	50 – 120
Heptachlor epoxide	50 – 150
Dieldrin	30 – 130
4,4'-DDE	50 – 150
Endrin	50 – 120
Endosulfan sulfate	50 – 120
trans-Chlordane	30 – 130
Tetrachloro-m-xylene (surrogate)	30 – 150
Decachlorobiphenyl (surrogate)	30 – 150

LCS concentrations:____0.25_ug/l;_16.7_ug/kg_____

List the %R of compounds which do not meet the criteria

LCS ID COMPOUND % R QC LIMIT

_____%_recovery_and_RPD_within_laboratory_control_limits._____
_____
_____
_____

Note:

Action

The following guidance is suggested for qualifying sample data for which the associated LCS does not meet the required criteria.

a. If the LCS recovery exceeds the upper acceptance limit, qualify detected target compounds as estimated (J). Do not qualify non-detected target compounds.

b. If the LCS recovery is less than the lower acceptance limit, qualify detected target compounds as estimated (J) and non-detects as unusable (R).

c. Use professional judgment to qualify data for compounds other than those compounds that are included in the LCS.

d. Use professional judgment to qualify non-LCS compounds. Take into account the compound class, compound recovery efficiency, analytical problems associated with each compound, and comparability in the performance of the LCS compound to the non-LCS compound.

e. If the LCS recovery is within allowable limits, no qualification of the data is necessary.

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? **Yes** or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met _____
Criteria were not met
and/or see below __N/A____

FLORISIL CARTRIDGE PERFORMANCE CHECK

NOTE: Florisil cartridge cleanup is mandatory for all extracts.

Criteria

Is the Florisil cartridge performance check conducted at least once on each lot of cartridges used for sample cleanup or every 6 months, whichever is most frequent? Yes? or No? **N/A**

Criteria

Are the results for the Florisil Cartridge Performance Check solution included with the data package? Yes? or No? **N/A**

Note: If % criteria are not met, examine the raw data for the presence of polar interferences and use professional judgment in qualifying the data as follows:

Action:

a. If the Percent Recovery is greater than 120% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.
b. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
c. If the Percent Recovery is greater than or equal to 10% and less than 80% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
d. If the Percent Recovery is less than 10% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J) and qualify non-detected target compounds as unusable (R).
e. If the Percent Recovery of 2,4,5-trichlorophenol in the Florisil Cartridge Performance Check is greater than or equal to 5%, use professional judgment to qualify detected and non-detected target compounds, considering interference on the sample chromatogram.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the Florisil Cartridge Performance Check analysis not yielding acceptable results.

Note:_ No information for Florisil cartridge performance check included in data package. There is evidence that Florisil cartridge was used for sample extraction/clean-up. No qualification of the data performed, professional judgment.

All criteria were met _____
Criteria were not met
and/or see below _____

GEL PERMEATION CHROMATOGRAPHY (GPC) PERFORMANCE CHECK

NOTE: GPC cleanup is mandatory for all soil samples.

If GPC criteria are not met, examine the raw data for the presence of high molecular weight contaminants; examine subsequent sample data for unusual peaks; and use professional judgment in qualifying the data. Notify the Contract Laboratory Program Project Officer (CLP PO) if the laboratory chooses to analyze samples under unacceptable GPC criteria.

Action:

a. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, the non-detected target compounds may be suspect, qualify detected compounds as estimated (J).
b. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, qualify all non-detected target compounds as unusable (R).
c. If the Percent Recovery is greater than or equal to 10% and is less than 80% for any of the pesticide target compounds in the GPC calibration, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
d. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
e. If high recoveries (i.e., greater than 120%) were obtained for the pesticides and surrogates during the GPC calibration check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the GPC cleanup analyses not yielding acceptable results.

Note:_ No information for performance of GPC cleanup included in data package. No qualification of the data performed, professional judgment.

All criteria were met ___X___
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

Criteria:

1. Is Retention Times (RTs) of both of the surrogates and reported target compounds in each sample within the calculated RT Windows on both columns? **Yes**? or No?

2. Is the Tetrachloro-m-xylene (TCX) RT ±0.05 minutes of the Mean RT (RT) determined from the initial calibration and Decachlorobiphenyl (DCB) within ±0.10 minutes of the RT determined from the initial calibration? **Yes**? or No?

3. Is the Percent Difference (%D) for the detected mean concentrations of a pesticide target compound between the two Gas Chromatograph (GC) columns within the inclusive range of ± 25.0 %? **Yes**? or No?

4. When no analytes are identified in a sample; are the chromatograms from the analyses of the sample extract and the low-point standard of the initial calibration associated with those analyses on the same scaling factor? **Yes**? or No?

5. Does the chromatograms display the Single Component Pesticides (SCPs) detected in the sample and the largest peak of any multi-component analyte detected in the sample at less than full scale. Yes? or **No**?

6. If an extract is diluted; does the chromatogram display SCPs peaks between 10-100% of full scale, and multi-component analytes between 25-100% of full scale? Yes? or No? **N/A**

7. For any sample; does the baseline of the chromatogram return to below 50% of full scale before the elution time of alpha-BHC, and also return to below 25% of full scale after the elution time of alpha-BHC and before the elution time of DCB? **Yes**? or No?

8. If a chromatogram is replotted electronically to meet these requirements; is the scaling factor used displayed on the chromatogram, and both the initial chromatogram and the replotted chromatogram submitted in the data package. Yes? or **No**?

Action:

a. If the qualitative criteria for both columns were not met, all target compounds that are reported as detected should be considered non-detected.

b. Use professional judgment to assign an appropriate quantitation limit using the following guidance:

i. If the detected target compound peak was sufficiently outside the pesticide RT Window, the reported values may be a false positive and should be replaced with the sample Contract Required Quantitation Limits (CRQL) value.

ii. If the detected target compound peak poses an interference with potential detection of another target peak, the reported value should be considered and qualified as unusable (R).

c. If the data reviewer identifies a peak in both GC column analyses that falls within the appropriate RT Windows, but was reported as a non-detect, the compound may be a false negative. Use professional judgment to decide if the compound should be included.

Note: State in the Data Review Narrative all conclusions made regarding target compound identification.

d. If the Toxaphene peak RT windows determined from the calibration overlap with SCPs or chromatographic interferences, use professional judgment to qualify the data.

e. If target compounds were detected on both GC columns, and the Percent Difference between the two results is greater than 25.0%, consider the potential for coelution and use professional judgment to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, use professional judgment to determine how best to report, and if necessary, qualify the data according to these guidelines.

f. If Toxaphene exhibits a marginal pattern-matching quality, use professional judgment to establish whether the differences are due to environmental "weathering" (i.e., degradation of the earlier eluting peaks relative to the later eluting peaks). If the presence of Toxaphene is strongly suggested, report results as presumptively present (N).

GAS CHROMATOGRAPH/MASS SPECTROMETER (GC/MS) CONFIRMATION

NOTE: This confirmation is not usually provided by the laboratory. In cases where it is provided, use professional judgment to determine if data qualified with "C" can be salvaged if it was previously qualified as unusable (R).

Action:

a. If the quantitative criteria for both columns were met (≥ 5.0 ng/µL for SCPs and ≥ 125 ng/µL for Toxaphene), determine whether GC/MS confirmation was performed. If it was performed, qualify the data using the following guidance:

i. If GC/MS confirmation was not required because the quantitative criteria for both columns was not met, but it was still performed, use professional judgment when evaluating the data to decide whether the detect should be qualified with "C".

ii. If GC/MS confirmation was performed, but unsuccessful for a target compound detected by GC/ECD analysis, qualify those detects as "X".

All criteria were met ___X___
Criteria were not met
and/or see below _____

COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC36372-4MS Aldrin RF =1.086

[ ] = $(542.1 \times 10^6)(50)/(403.5 \times 10^6)(1.086)$
= 61.9 ppb Ok

Action:

a. If sample quantitation is different from the reported value, qualify result as unusable (R).
b. When a sample is analyzed at more than one dilution, the lowest CRQLs are used unless a QC exceedance dictates the use of the higher CRQLs from the diluted sample.
c. Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and its corresponding value on the original reporting form and substituting the data from the diluted sample.
d. Results between the MDL and CRQL should be qualified as estimated (J).
e. Results less than the MDL should be reported at the CRQL and qualified (U). MDLs themselves are not reported.
f. For non-aqueous samples, if the percent moisture is less than 70.0%, no qualification of the data is necessary. If the percent moisture is greater than or equal to 70.0% and less than 90.0%, qualify detects as estimated (J) and non-detects as approximated (UJ). If the percent moisture is greater than or equal to 90.0%, qualify detects as estimated (J) and non-detects as unusable (R) (see Table).

Percent Moisture Actions for Pesticide Analysis for Non-Aqueous Samples

Criteria	Action	
	Detected Associated Compounds	Non-detected Associated Compounds
% Moisture < 70.0	No qualification	
70.0 < % Moisture < 90.0	J	UJ
% Moisture > 90.0	J	R

List samples which have $\leq$ 50 % solids

Note: If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.

Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

All criteria were met __X__
Criteria were not met
and/or see below _____

FIELD DUPLICATE PRECISION

NOTE: In the absence of QAPP guidance for validating data from field duplicates, the following action will be taken.

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples. Identify which samples within the data package are field duplicates. Estimate the relative percent difference (RPD) between the values for each compound. If large RPDs (> 50%) is observed, confirm identification of samples and note difference in the executive summary.

Sample IDs: _JC36372-2/JC36372-3____ Matrix:___Soil_____

COMPOUND	SQL ug/L	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Field duplicate analyzed with this data package. RPD within the required criteria of < 50 %.					

Actions:

a. Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

b. If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

i. If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

ii. If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

iii. If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

iv. If both sample and duplicate results are not detected, no action is needed.

OVERALL ASSESSMENT OF DATA
Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.

2. Write a brief narrative to give the user an indication of the analytical limitations of the data.

Note: The Contract Laboratory Program Project Officer (CLP PO) must be informed if any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

Overall assessment of the data: Results are valid; the data can be used for decision making purposes.

EXECUTIVE NARRATIVE

SDG No:	**JC36372**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8015C**	Number of Samples:	**7**
Location:	BMSMC, Humacao, PR		

SUMMARY: Seven (7) samples were analyzed for the trace metals following method SW846-6010C and SW846-7470A/7471B for Hg. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: *Hazardous Waste Support Section SOP NO. HW-3b Revision 0 (July 2015) ISM02 ICP-MS Data Validation; USEPA Contract Laboratory program National Functional Guidelines for Inorganic data Review (OSWER 9240.1-45, EPA 540-R-04-004, October 2004- Final). Validation of Metal for the Contract Laboratory Program (CLP) (SOP HW-2, Revision 13. Based on ILM05.3 (August 2009).* Quality control validation criteria were derived from *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, 1998)"*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings:

1. Target analytes not detected in the field/equipment blank except for the cases described in this document:

- Ba, Ca, Mn and Na detected in the field blank at a concentration below the reporting limit. The laboratory qualified the results with a B qualifier. No further
- Ba, Ca, Mn, Hg and Na detected in the equipment blank at a concentration below the reporting limit.

The laboratory qualified the results with a B qualifier. No further qualification performed.

2. MS/MSD % recovery and RPD within laboratory control limits except for the cases described in the Data Review Worksheet.

No action taken on samples with high analyte concentration compared to the amount spiked.

No action taken on samples with either the MS or MSD % recovery within laboratory and guidance document control limits, professional judgment

No qualification made based on RPD outside laboratory control limits, professional judgment.

Results for Sb qualified as estimated (J or UJ) in all samples.

No MS/MSD sample analyzed for the aqueous matrix, except for Hg.

3. Positive results with concentration between the MDL and the reporting limit (RL) are qualified as estimated (J or UJ).

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: February 18, 2017

SAMPLE METAL DATA SAMPLE SUMMARY

Sample ID: JC36372-1
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 6010C/7471B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aluminum	21800	ug/kg	1.0	-	-	Yes
Antimony	0.39	ug/kg	1.0	B	JB	Yes
Arsenic	2.0	ug/kg	1.0	B	JB	Yes
Barium	113	ug/kg	1.0	-	-	Yes
Beryllium	0.21	ug/kg	1.0	B	JB	Yes
Cadmium	0.14	ug/kg	1.0	B	JB	Yes
Calcium	6510	ug/kg	1.0	-	-	Yes
Chromium	11.9	ug/kg	1.0	-	-	Yes
Cobalt	15.2	ug/kg	1.0	-	-	Yes
Copper	39.2	ug/kg	1.0	-	-	Yes
Iron	35000	ug/kg	2.0	-	-	Yes
Lead	7.7	ug/kg	1.0	-	-	Yes
Magnesium	7630	ug/kg	1.0	-	-	Yes
Manganese	873	ug/kg	1.0	-	-	Yes
Mercury	0.031	ug/kg	1.0	B	JB	Yes
Nickel	5.5	ug/kg	1.0	-	-	Yes
Potassium	1580	ug/kg	1.0	-	-	Yes
Selenium	0.51	ug/kg	1.0	U	U	Yes
Silver	0.22	ug/kg	2.0	U	U	Yes
Sodium	353	ug/kg	1.0	B	JB	Yes
Thallium	0.44	ug/kg	1.0	U	U	Yes
Vanadium	94.3	ug/kg	1.0	-	-	Yes
Zinc	139	ug/kg	1.0	-	-	Yes

Sample ID: JC36372-2
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 6010C/7471B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aluminum	18000	ug/kg	1.0	-	-	Yes
Antimony	0.63	ug/kg	1.0	B	JB	Yes
Arsenic	1.6	ug/kg	1.0	B	JB	Yes
Barium	98.9	ug/kg	1.0	-	-	Yes
Beryllium	0.16	ug/kg	1.0	B	JB	Yes
Cadmium	0.16	ug/kg	1.0	B	JB	Yes
Calcium	10000	ug/kg	1.0	-	-	Yes
Chromium	20.4	ug/kg	1.0	-	-	Yes
Cobalt	13.3	ug/kg	1.0	-	-	Yes
Copper	38.3	ug/kg	1.0	-	-	Yes
Iron	29200	ug/kg	1.0	-	-	Yes
Lead	9.2	ug/kg	1.0	-	-	Yes
Magnesium	7230	ug/kg	1.0	-	-	Yes
Manganese	797	ug/kg	1.0	-	-	Yes
Mercury	0.050	ug/kg	1.0	-	-	Yes
Nickel	13.5	ug/kg	1.0	-	-	Yes
Potassium	2210	ug/kg	1.0	-	-	Yes
Selenium	0.58	ug/kg	1.0	U	U	Yes
Silver	0.12	ug/kg	1.0	U	U	Yes
Sodium	144	ug/kg	1.0	B	JB	Yes
Thallium	0.50	ug/kg	1.0	U	U	Yes
Vanadium	81.8	ug/kg	1.0	-	-	Yes
Zinc	129	ug/kg	1.0	-	-	Yes

Sample ID: JC36372-4
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 6010C/7471B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aluminum	17000	ug/kg	1.0	-	-	Yes
Antimony	0.70	ug/kg	1.0	B	JB	Yes
Arsenic	1.8	ug/kg	1.0	B	JB	Yes
Barium	97.5	ug/kg	1.0	-	-	Yes
Beryllium	0.16	ug/kg	1.0	B	JB	Yes
Cadmium	0.17	ug/kg	1.0	B	JB	Yes
Calcium	5110	ug/kg	1.0	-	-	Yes
Chromium	12.6	ug/kg	1.0	-	-	Yes
Cobalt	10.8	ug/kg	1.0	-	-	Yes
Copper	35.3	ug/kg	1.0	-	-	Yes
Iron	27200	ug/kg	1.0	-	-	Yes
Lead	29	ug/kg	1.0	-	-	Yes
Magnesium	4820	ug/kg	1.0	-	-	Yes
Manganese	621	ug/kg	1.0	-	-	Yes
Mercury	0.10	ug/kg	1.0	-	-	Yes
Nickel	6.2	ug/kg	1.0	-	-	Yes
Potassium	1180	ug/kg	1.0	-	-	Yes
Selenium	0.51	ug/kg	1.0	U	U	Yes
Silver	0.11	ug/kg	1.0	U	U	Yes
Sodium	183	ug/kg	1.0	B	JB	Yes
Thallium	0.44	ug/kg	1.0	U	U	Yes
Vanadium	81.3	ug/kg	1.0	-	-	Yes
Zinc	85.1	ug/kg	1.0	-	-	Yes

Sample ID: JC36372-4MS
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 6010C/7471B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aluminum	31800	ug/kg	1.0	-	-	Yes
Antimony	103	ug/kg	1.0	-	-	Yes
Arsenic	247	ug/kg	1.0	-	-	Yes
Barium	437	ug/kg	1.0	-	-	Yes
Beryllium	257	ug/kg	1.0	-	-	Yes
Cadmium	252	ug/kg	1.0	-	-	Yes
Calcium	11600	ug/kg	1.0	-	-	Yes
Chromium	272	ug/kg	1.0	-	-	Yes
Cobalt	270	ug/kg	1.0	-	-	Yes
Copper	305	ug/kg	1.0	-	-	Yes
Iron	39000	ug/kg	1.0	-	-	Yes
Lead	287	ug/kg	1.0	-	-	Yes
Magnesium	9100	ug/kg	1.0	-	-	Yes
Manganese	1450	ug/kg	1.0	-	-	Yes
Mercury	0.373	ug/kg	1.0	-	-	Yes
Nickel	265	ug/kg	1.0	-	-	Yes
Potassium	4870	ug/kg	1.0	-	-	Yes
Selenium	247	ug/kg	1.0	-	-	Yes
Silver	30.1	ug/kg	1.0	-	-	Yes
Sodium	3550	ug/kg	1.0	-	-	Yes
Thallium	250	ug/kg	1.0	-	-	Yes
Vanadium	346	ug/kg	1.0	-	-	Yes
Zinc	339	ug/kg	1.0	-	-	Yes

Sample ID: JC36372-4MSD
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: Soil

METHOD: 6010C/7471B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aluminum	25900	ug/kg	1.0	-	-	Yes
Antimony	103	ug/kg	1.0	-	-	Yes
Arsenic	228	ug/kg	1.0	-	-	Yes
Barium	338	ug/kg	1.0	-	-	Yes
Beryllium	237	ug/kg	1.0	-	-	Yes
Cadmium	234	ug/kg	1.0	-	-	Yes
Calcium	8440	ug/kg	1.0	-	-	Yes
Chromium	245	ug/kg	1.0	-	-	Yes
Cobalt	245	ug/kg	1.0	-	-	Yes
Copper	274	ug/kg	1.0	-	-	Yes
Iron	29800	ug/kg	1.0	-	-	Yes
Lead	256	ug/kg	1.0	-	-	Yes
Magnesium	7450	ug/kg	1.0	-	-	Yes
Manganese	848	ug/kg	1.0	-	-	Yes
Mercury	0.378	ug/kg	1.0	-	-	Yes
Nickel	242	ug/kg	1.0	-	-	Yes
Potassium	4280	ug/kg	1.0	-	-	Yes
Selenium	229	ug/kg	1.0	-	-	Yes
Silver	28.6	ug/kg	1.0	-	-	Yes
Sodium	3230	ug/kg	1.0	-	-	Yes
Thallium	234	ug/kg	1.0	-	-	Yes
Vanadium	309	ug/kg	1.0	-	-	Yes
Zinc	305	ug/kg	1.0	-	-	Yes

Sample ID: JC36372-5
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: AQ - Field Blank Soil

METHOD: 6010C/7471B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aluminum	21	ug/l	1.0	U	U	Yes
Antimony	3.3	ug/l	1.0	U	U	Yes
Arsenic	2.2	ug/l	1.0	U	U	Yes
Barium	1.6	ug/l	1.0	B	JB	Yes
Beryllium	0.25	ug/l	1.0	U	U	Yes
Cadmium	0.4	ug/l	1.0	U	U	Yes
Calcium	188	ug/l	1.0	B	JB	Yes
Chromium	0.81	ug/l	1.0	U	U	Yes
Cobalt	0.69	ug/l	1.0	U	U	Yes
Copper	2.4	ug/l	1.0	U	U	Yes
Iron	12	ug/l	1.0	U	U	Yes
Lead	2.3	ug/l	1.0	U	U	Yes
Magnesium	85	ug/l	1.0	U	U	Yes
Manganese	5.1	ug/l	1.0	B	JB	Yes
Mercury	0.047	ug/l	1.0	U	U	Yes
Nickel	0.76	ug/l	1.0	U	U	Yes
Potassium	120	ug/l	1.0	U	U	Yes
Selenium	4.1	ug/l	1.0	U	U	Yes
Silver	0.88	ug/l	1.0	U	U	Yes
Sodium	154	ug/l	1.0	B	JB	Yes
Thallium	1.9	ug/l	1.0	U	U	Yes
Vanadium	0.66	ug/l	1.0	U	U	Yes
Zinc	1.3	ug/l	1.0	U	U	Yes

Sample ID: JC36372-6
Sample location: BMSMC, Humacao, PR
Sampling date: 26-Jan-17
Matrix: AQ - Equipment Blank

METHOD: 6010C/7471B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aluminum	21	ug/l	1.0	U	U	Yes
Antimony	3.3	ug/l	1.0	U	U	Yes
Arsenic	2.2	ug/l	1.0	U	U	Yes
Barium	1.9	ug/l	1.0	B	JB	Yes
Beryllium	0.25	ug/l	1.0	U	U	Yes
Cadmium	0.4	ug/l	1.0	U	U	Yes
Calcium	86.9	ug/l	1.0	B	JB	Yes
Chromium	0.81	ug/l	1.0	U	U	Yes
Cobalt	0.69	ug/l	1.0	U	U	Yes
Copper	2.4	ug/l	1.0	U	U	Yes
Iron	12	ug/l	1.0	U	U	Yes
Lead	2.3	ug/l	1.0	U	U	Yes
Magnesium	85	ug/l	1.0	U	U	Yes
Manganese	2.1	ug/l	1.0	B	JB	Yes
Mercury	0.067	ug/l	1.0	B	JB	Yes
Nickel	1.00	ug/l	1.0	B	JB	Yes
Potassium	120	ug/l	1.0	U	U	Yes
Selenium	4.1	ug/l	1.0	U	U	Yes
Silver	0.88	ug/l	1.0	U	U	Yes
Sodium	65.7	ug/l	1.0	B	JB	Yes
Thallium	1.9	ug/l	1.0	U	U	Yes
Vanadium	0.66	ug/l	1.0	U	U	Yes
Zinc	1.3	ug/l	1.0	U	U	Yes

DATA REVIEW WORKSHEETS

Type of validation Full:___X_____ Project Number:____JC36372_____
Limited:_____ Date:_____01/26/17_____
EPA Region:__2__ Date shipped:___01/26/17_____

REVIEW OF INORGANIC ANALYSIS DATA PACKAGE

The following guidelines for evaluating metals analyses (6010C/6020/7000A series method) sulfide, and/or cyanide were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: *Hazardous Waste Support Section SOP N0. HW-3b Revision 0 (July 2015) ISM02 ICP-MS Data Validation; USEPA Contract Laboratory program National Functional Guidelines for Inorganic data Review (OSWER 9240.1-45, EPA 540-R-04-004, October 2004- Final). Validation of Metal for the Contract Laboratory Program (CLP) (SOP HW-2, Revision 13. Based on ILM05.3 (August 2009).* Quality control validation criteria were derived from *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, 1998)".* The project QAPP is reviewed for project specific information (if available). The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for inorganic included:

Lab. Project/SDG No.: ____JC36372_____ Sample matrix: _____Soil____
No. of Samples: _____7_____
Field blank No.: _____JC36372-5_____
Equipment blank No.: _____JC36372-6_____
Field duplicate No.: _____-_____

___X___ Data deliverables
___X___ Holding Times
___X___ Calibrations
___X___ Blanks
___X___ ICP Interference Check Results
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Duplicates
___X___ Field Duplicates
___X___ Laboratory Control Samples
___X___ ICP Serial Dilution Results
___X___ Detection Limits Results
___X___ Sample Quantitation

Overall Comments: _Metal_Analysis_(SW846-6010C);_Hg_(SW846-7470A/7471B)_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated non-detect
E- Laboratory qualifier

Reviewer:_____

Date:__02/18/2017_____

All criteria were met __X____
Criteria were not met
and/or see below _____

I. DATA DELIVERABLES

A. Data Package:

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

B. Other Discrepancies:

All criteria were met __X___
Criteria were not met
and/or see below _____

HOLDING TIMES
The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of preparation, and subsequently from the time of preparation to the time of analysis.

Complete table for all samples and circle the analysis date for samples not within criteria

SAMPLE ID	DATE SAMPLED	CYANIDE DATE ANALYSIS	Hg DATE ANALYSIS	OTHERS DATE ANALYSIS	pH	SULFIDE	ACTION
SAMPLES DIGESTED AND ANALYZED WITHIN THE METHOD RECOMMENDED HOLDING							

Criteria

Metals – 180 days from time of collection.
Mercury – 28 days from time of collection.
Hexavalent Chromium (solids)- 30/7 from day of collection; 48 hrs aqueous samples
Cyanide – 14 days from time of collection
Sulfide - 14 days from time of collection
pH measurements of aqueous samples upon receipt at the laboratory (criteria pH $\leq$ 2 for metals; pH $\geq$ 12 for cyanide)

Actions: Qualify positive results/nondetects as follows:

If holding times are exceeded, estimate positive results (J) and rejects nondetects (R).
If pH > 2 for metals or pH < 12 for cyanide, positive results (J) and nondetects (UJ).
Cooler Temperature (Criteria: 4°C + 2°C):___3.6°C_____.
If cooler temperature is > 10°C, flag non-detects as (UJ) and detects as (J).

All criteria were met __N/A___
Criteria were not met
and/or see below _____

ICP-MS TUNE ANALYSIS

Is the ICP-MS tuned prior to calibration? Yes or No?

Does the % RSD exceeds 5% for any isotope in the tuning solution? Yes or No?

Action:

NOTES: For ICP-MS tunes that do not meet the technical criteria, apply the action to all samples reported from the analytical run.

1. If the ICP-MS instrument was not tuned prior to calibration, the sample data should be qualified as unusable (R).

2. If the tuning solution was not analyzed or scanned at least 5x consecutively or the tuning solution does not contain the required analytes spanning the analytical range, the reviewer should use professional judgment to determine if the associated sample data should be qualified. The reviewer may need to obtain additional information from the laboratory. The situation should be recorded in the Data Review Narrative and noted for Contract Laboratory Program Project Officer (CLP PO) action.

3. If the resolution of the mass calibration is not within 0.1 u for any isotope in the tuning solution, qualify all analyte results that are ≥ Method Detection Limit (MDL) associated with that isotope as estimated (J), and all non-detects associated with that isotope as estimated (UJ). The situation should be recorded in the Data Review Narrative and noted for CLP PO action.

4. If the %RSD exceeds 5% for any isotope in the tuning solution, qualify all sample results that are ≥ MDL associated with that tune as estimated (J), and all non-detects associated with that tune as estimated (UJ). The situation should be recorded in the Data Review Narrative and noted for CLP PO action.

Table 2. ICP-MS Tune Actions for ICP-MS Analysis

ICP-MS Tune Results	Action for Samples
Tune not performed	Qualify all results as unusable (R)
Tune not performed properly	Use professional judgment
Resolution of mass calibration not within 0.1u	Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as estimated (UJ)
% RSD > 5%	Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as estimated (UJ)

Note:

All criteria were met __X___
Criteria were not met
and/or see below _____

INSTRUMENT CALIBRATION (SECTION 1)

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data. Minimum of 2 calibration points for ICP-AES and ICP-MS; 5 points for Hg; and 4 points for cyanide. One initial calibration standard at the CRQL level for cyanide and Hg. If no, write in the non-compliance section of the data review narrative.

List the analytes which did not meet the percent recovery (%R) criteria for Initial or Continuing Calibration Verification standards (ICV or CCV).

Acceptance Criteria	ICV %R	CCV %R
Metals by 6010C/6020	100 + 10%	100 + 10%
Mercury/Metals by 7000s	100 + 10%	100 + 20%
Cyanide	100 + 15%	100 + 15%
Sulfide	100 + 15%	100 + 15%

DATE	ICV/CCV#	ANALYTE	%R	ACTION	SAMPLES AFFECTED
INITIAL AND CONTINUING CALIBRATION MEET METHOD SPECIFIC CRITERIA					

ACTIONS: If any analyte does not meet the %R criteria, follow the actions stated below. Qualify five samples on either side of the ICV/CCV out of control limit.

Estimate positive results (J) if:	ICV	CCV
Metals by 6010C/6020	111 – 125%	111 – 125%
Mercury/Metals by 7000s	111 – 125%	111 – 135%
Cyanide	116 – 130%	116 – 130%
Sulfide	116 – 130%	116 – 130%
Estimate positive results and nondetects (U/UJ) if:		
Metals by 6010C/6020	75 – 89%	75 – 89%
Mercury/Metals by 7000s	75 – 89%	65 – 79%
Cyanide	70 – 84%	70 – 84%
Sulfide	70 – 84%	70 – 84%
Reject positive results and nondetects (R) if:		
Metals by 6010C/6020	<75%, >125%	<75%, >125%
Mercury/Metals by 7000s	<75%, >125%	<65%, >135%
Cyanide	<70%, >130%	<70%, >130%
Sulfide	<70%, >130%	<70%, >130%

All criteria were met __X___
Criteria were not met
and/or see below _____

III. INSTRUMENT CALIBRATIONS (SECTIONS 2 & 3)

2. Analytical Sequence

Did the laboratory use the proper number of standards for calibration as described in the method? **Yes** or No

B. Were calibrations performed at the beginning of each analysis? **Yes** or No

Were calibration verification standards analyzed at the beginning of sample analysis and the proper frequency according to the method? **Yes** or No

D. Where the AA correlation coefficients (r) for the calibration curves $\geq$ 0.995? If r < 0.995, estimate positive results and nondetects (J/UJ). It is not necessary to qualify results if the laboratory used order regression. **Yes** or No

Data quality may be affected if any of the above answer are "no". Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below and list the sample affected.

3. Other Check Standards

Laboratories may analyze an additional check standard after establishing the calibration curve. This standard may contain low level concentrations of target analytes and be analyzed and evaluated by the laboratory similar to a CLP "CRLD" standard (CRI for ICP, CRA for AA, and/or mid-range standard for CN and Sulfide). A 100 $\pm$ 20% recovery acceptance limit should be used by the validator to evaluate the standard.

ACTIONS: If any analyte does not meet the %R criteria, follow the action needed below. Qualify 50% of either side of the CRI/CRA out of control limits.

% R	%R < 50%	%R = 50-79%	%R = 121-150%	%R > 150%	Affected Range
Qualify Positive/Nondetects Results					
Metals by 6010C/6020	R/R	J/UJ	J/A	R/A	<2x CRI conc.
Hg/metals by 7000s	R/R	J/UJ	J/A	R/A	<1.5x CRI conc.
Cyanide	R/R	J/UJ	J/A	R/A	<1.5x mid std. conc.
Sulfide	R/R	J/UJ	J/A	R/A	<1.5x mid std. conc.

CRI is not required for Al, Ba, Ca, Fe, Mg, Na, and K.

NOTE: CRLD standard within laboratory and method specific criteria.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

Table 4. Calibration Actions for ICP-MS Analysis

Calibration Result	Action for Samples
Calibration not performed	Qualify all results as unusable (R)
Calibration incomplete	Use professional judgment Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as estimated (UJ)
Not at least one calibration standard at or below the CRQL for each analyte	Qualify results that are ≥ MDL but < 2x the CRQL as estimated (J) Qualify non-detects as estimated (UJ)
Correlation coefficient < 0.995; %D outside ±30%; y-intercept ≥ CRQL	Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as estimated (UJ)
Correlation coefficient < 0.990	Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as unusable (R)
ICV/CCV %R < 75%	Qualify results that are ≥ MDL as unusable (R) Qualify all non-detects as unusable (R)
ICV/CCV %R 75-89%	Qualify results that are ≥ MDL as estimated low (J-) Qualify non-detects as estimated (UJ)
ICV/CCV %R 111-125%	Qualify results that are ≥ MDL as estimated high (J+)
ICV/CCV %R > 125%	Qualify results that are ≥ MDL as estimated high (J+)
ICV/CCV %R > 160%	Qualify results that are ≥ MDL as unusable (R)

All criteria were met _____
Criteria were not met
and/or see below ___X___

IV. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including equipment, field, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in Sections 1 & 2 below. A separate worksheet page should be used for soil and water blanks.

Laboratory blanks Matrix:___Aqueous_____

DATE ANALYZED	ICB/CCB#	PREP BLK	ANALYTE	CONCENTRATION UNITS

__No_analyte_detected_in_method_blanks_above_reporting_limits._____

Field/Equipment Matrix:___Aqueous_____

DATE ANALYZED	EQUIPMENT/FIELD BLANK	ANALYTE	CONCENTRATION UNITS
__Field/equipment_blank_analyzed_as_part_of_this_data_package._____			

Note: Terget analytes not detected in the field/equipment blank except for the cases described in this document:

- Ba, Ca, Mn and Na detected in the field blank at a concentration below the reporting limit. The laboratory qualified the results with a B qualifier. No further
- Ba, Ca, Mn, Hg and Na detected in the equipment blank at a concentration below the reporting limit.

The laboratory qualified the results with a B qualifier. No further qualification performed.

Table. Field/Rinsate/Trip Blank Actions for ICP-MS Analysis

Blank Result	Sample Result	Action for Samples
> CRQL	≥ MDL but ≤ CRQL	Report CRQL value with a "U"
	> CRQL but < Blank Result	Report at level of Blank Result with a "U"
	> Blank Result but < 10x the Blank Result	Use professional judgment to qualify results as estimated (J)

All criteria were met __X___
Criteria were not met
and/or see below _____

IV. BLANK ANALYSIS RESULTS (Section 3)

Frequency requirements

Was the preparation blank analyzed for each matrix,
at the frequency of the method? **Yes** or No
If no, estimate positive results < 10x IDL for which preparation blank was not analyzed.
If more than 20 samples/batch, qualification begins at the 21st sample.

B. Was an ICB analyzed? **Yes** or No

C. Was a CCB analyzed at the frequency stated in the method? **Yes** or No

Data quality may be affected if any of the above answer is "no". Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

NOTE FOR SOIL SAMPLES
Compare raw sample value with blank results in ug/L unit, or
Convert blanks analyzed during a soil case to mg/Kg in order to compare them with the sample results.

Conc. In ug/L x [Volume diluted to (mL)]/[Weight digested] x 1L/1000mL x 1000g/1Kg x 1mg/1000□g = concentration in wet weight (mg/Kg)

Concentration, dry weight (mg/Kg) = (Wet weight concentration)/(% Solids) x 100

BLANK ANALYSIS RESULTS (Sections 4,5)

Laboratory blanks (PB, ICB/CCB) must first be used to qualify field and/or equipment blanks and samples.
Any contamination remaining in the field or equipment blank will be used to qualify the associated samples.

All criteria were met __X___
Criteria were not met
and/or see below _____

4. Initial/Continuing Calibration Blanks (ICB/CCB) Actions

Are all ICB/CCBs less than the SQL? **Yes** or No

If no, qualify five samples on either side of the ICB/CCB out of control limits.
Estimate positive results (J) ≤ the ICB/CCB value.

ICB/CCB#	ANALYTE	CONC/UNITS	SAMPLES AFFECTED

Are the PB less than the SQL? **Yes** or No

If yes, reject all results (R) < 10x the PB value.

PB	ANALYTE	CONC/UNITS	SAMPLES AFFECTED

BLANK ANALYSIS RESULTS (Section 6)

6. Field/Equipment Blank (FB/EB) Actions

Are the FB/EB less than the SQL? **Yes** or No

If no, was the FB/EB value already rejected due to other QC criteria? Yes or No

If no, reject (R) positive results ≤ 5x the FB/EB value. Reject soil data with raw digest results < 5x the FB/EB value

PB	ANALYTE	CONC/UNITS	SAMPLES AFFECTED

All criteria were met __N/A___
Criteria were not met
and/or see below _____

Table 5. Calibration/Preparation Blank Actions for ICP-MS Analysis - Summary

Blank Type	Blank Result	Sample Result	Action for Samples
ICB/CCB	≥ MDL but ≤ CRQL	Non-detect	No action
≥ MDL but ≤ CRQL		Report CRQL value with a "U"	
> CRQL		Use professional judgment	
ICB/CCB	> CRQL	≥ MDL but ≤ CRQL	Report CRQL value with a "U"
> CRQL but < Blank Result		Report at level of Blank Result with a "U"	
> Blank Result		Use professional judgment	
ICB/CCB	≤ (-MDL) but ≥ (-CRQL)	≥ MDL, or non-detect	Use professional judgment
ICB/CCB	< (-CRQL)	< 10x the CRQL	Qualify results that are ≥ CRQL as estimated low (J-) Qualify non-detects as estimated (UJ)
Preparation Blank	> CRQL	≥ MDL but ≤ CRQL	Report CRQL value with a "U"
> CRQL but < 10x the Blank Result		Qualify results as estimated high (J+)	
≥ 10x the Blank Result		No action	
Preparation Blank	≥ MDL but ≤ CRQL	Non-detect	No action
≥ MDL but ≤ CRQL		Report CRQL value with a "U"	
> CRQL		Use professional judgment	
Preparation Blank	< (-CRQL)	< 10x the CRQL	Qualify results that are ≥ CRQL as estimated low (J-) Qualify non-detects as estimated (UJ)

All criteria were met __X___
Criteria were not met
and/or see below _____

INDUCTIVELY COUPLED PLASMA (ICP) INTERFERENCE CHECK SAMPLE

The assessment of the ICP interference check sample (ICS) is to verify the laboratory's interelement and background correction factors.

1. Recovery Criteria

List any elements in the ICS AB and ICS A solutions which did not meet the %R criteria (80 – 120 %).

DATE ELEMENT %R ACTION SAMPLES AFFECTED

_Interference_check_sample_within_method_performance_criteria___ _____

ACTIONS:

If an element does not meet the %R criteria, follow the actions stated below

% R	%R < 50%	%R = 50-79%	%R = 121-150%	%R > 150%
Qualify Positive/Nondetects Results				
Metals by 6010C/6020	R/R	J/UJ	J/A	R/A

2. Frequency requirements

Were interference QC samples run at the frequency stated in the method (beginning of the analytical run)? **Yes** or No

If no,
ACTIONS: Estimate positive results (J) all samples for which Al, Ca, Fe, Mg > ICS value.

The data may be affected. Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below and list the samples affected.

All criteria were met ___N/A____
Criteria were not met
and/or see below _____

Table 6. Interference Check Actions for ICP-MS Analysis - Summary

Interference Check Sample Results	Action for Samples
ICS not analyzed	Qualify detects and non-detects as unusable (R)
ICS not analyzed in proper sequence	Use professional judgment.
ICS %R>150%	Use professional judgment
ICS %R > 120% (or greater than true value + 2x the CRQL)	Qualify results that are ≥ MDL as estimated high (J+)
ICS %R 80-12-%	No qualification
ICS %R 50-79% (or less than true value – 2x the CRQL)	Qualify results that are ≥ MDL as estimated low (J-) Qualify non-detects as estimated (UJ)
ICSAB %R < 50%	Qualify detects as estimated low (J-) and non-detects as unusable (R)
Potential false positives in field samples with interferents	Qualify results that are ≥ MDL as estimated high (J+)
Potential false negatives in field samples with interferents	Qualify results that are ≥ MDL but < 10x the (|negative value|) as estimated low (J-) Qualify non-detects as estimated (UJ)

All criteria were met _____
Criteria were not met
and/or see below __X___

VI. MATRIX SPIKE (MS)

Sample # _JC36372-4MS/-4MSD_____ Matrix:__Soil__ Units: __ug/kg__
Sample # _JC36275-2AMS/-2AMSD_(Hg)_ Matrix:__Aqueous__ Units: __ug/l____

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. Note that for Region 2, MS not required for: Ca, Mg, K, and Na for aqueous matrix.

Al, Ca, Fe, Mg, K, Na, for soil matrix
MS Recovery Criteria. List the percent recoveries for analytes which did not meet the %R criteria (75 – 125%); (85 – 115 % FOR Cr (VI)).

ANALYTE	SPIKE SAMPLE RESULT (SSR)	SAMPLE RESULT (SR)	SPIKE ADDED	% R	ACTION
MS/MSD recoveries and RPD within laboratory control limits except for the cases described in this document.					
Al	31800	17000	2880	513.3	No action
Sb	103	0.70	231	44.3	Qualify results (J or UJ)
Ba	437	97.5	231	147.2	No action^
Ca	11600	5110	2880	225.1	No action^
Fe	39000	27200	2880	409.2	No action
Mg	9100	4820	2880	148.4	No action^
Mn	1450	621	231	359.4	No action^
K	4870	1180	2880	228.0	No action^
Al	25900	17000	2880	317.9	No action
Sb	103	0.70	231	45.7	Qualify results (J or UJ)

Note: No action taken, sample concentration high compared to the amount spiked.

^- no action taken, professional judgment. Either the MS/MSD % recovery within laboratory and guidance document control limits.

No qualification made based on RPD outside laboratory control limits, professional judgment.

Results for Sb qualified as estimated (J or UJ) in all samples.

No MS/MSD sample analyzed for the aqueous matrix, except for Hg.

ACTIONS: Matrix spike actions apply to all samples of the same matrix. The qualification will also be applied to the results of all samples within a given area of the site, if deemed appropriate.

If the sample results ≥ 4x the spike concentration, no action is taken.
If any analyte does not meet the %R criteria, follow the actions stated below.

Table 9. Spike Sample Actions for ICP-MS Analysis

Spike Sample Results	Action for Samples
Matrix Spike %R < 30% Post-digestion spike %R < 75%	Qualify affected results that are ≥ MDL as estimated low (J-) and affected non-detects as unusable (R)
Matrix Spike %R < 30% Post-digestion spike %R ≥ 75%	Qualify affected results that are ≥ MDL as estimated (J) and affected non-detects as estimated (UJ)
Matrix Spike %R 30-74% Post-digestion Spike %R < 75%	Qualify affected results that are ≥ MDL as estimated low (J-) and affected non-detects as estimated (UJ)
Matrix Spike %R 30-74% Post-digestion spike %R ≥ 75%	Qualify affected results that are ≥ MDL as estimated (J) and affected non-detects as estimated (UJ)
Matrix Spike %R > 125% Post-digestion spike %R > 125%	Qualify affected results that are ≥ MDL as estimated high (J+)
Matrix Spike %R > 125% Post-digestion spike %R ≤ 125%	Qualify affected results that are ≥ MDL as estimated (J)

Spike Sample Results	Action for Samples
Matrix Spike %R < 30% No post-digestion spike performed	Qualify affected results that are ≥ MDL as estimated low (J-) and affected non-detects as unusable (R)
Matrix Spike %R 30-74% No post-digestion spike performed	Qualify affected results that are ≥ MDL as estimated low (J-) and non-detects as estimated (UJ)
Matrix Spike %R > 125% No post-digestion spike performed	Qualify affected results that are ≥ MDL as estimated high (J+) Non-detects are not qualified

2. Frequency Criteria

A. Was a matrix spike prepared at the frequency stated in the method (1/20)? **Yes** or No

If no, estimate positive results (J) for which analyte was not spiked.
If more than 20 samples/batch, qualification begins at the 21st sample.

B. Was a field blank used as spiked sample? Yes or **No**

If yes, estimate positive results (J) < 4x spike level added for the analyte.

A separate worksheet page should be used for each matrix spike

All criteria were met __N/A___
Criteria were not met
and/or see below ____

VII. FIELD DUPLICATES

Sample #:_____-_____ Matrix:_____-_____ Units:_ug/L__

Field duplicate samples may be taken and analyzed as an indication of overall precision. Field duplicate analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which measure only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

List the concentrations and RPDs in the field duplicate pair. RPD criteria: ± 20% for aqueous; ± 35% for soil. For soil duplicates, if the % solids for the sample and its duplicate differ by more than 1%, report concentrations in ug/L and calculate RPD or difference for each analyte.

ANALYTE	SQL ug/L	SQL ug/Kg	SAMPLE RESULTS	DUPLICATE RESULTS	RPD	ACTION
Al					20.5	No action
Sb						
As						
Ba					25.5	No action
Be						
Cd						
Ca					31.5	No action
Cr						
Co						
Cu						
Fe					26.7	No action
Pb						
Mg						
Mn					52.4	No action
Hg						
Ni						
K						
Se						
Ag						
Na						
Tl						
V						
Zn						
Cyanide						
Cr(VI)						

Note: No field/laboratory duplicates analyzed with data set. MS/MSD % recoveries RPD used to assess precision. RPD within laboratory and generally acceptable control limits except for the cases described in this document. No qualification made based on RPD results

Field duplicate actions should be applied to only the sample and its duplicate.

All criteria were met __N/A___
Criteria were not met
and/or see below ____

Actions: Indicates which criterion was used to evaluate precision by circling either the RPD or SQL for each element. If both sample and duplicate are nondetects, the RPD is not calculated (NC), no action is needed.

Table 8. Duplicate Sample Actions for ICP-MS Analysis

Duplicate Sample Results	Action for Samples
Aqueous: Both original sample and duplicate sample > 5x the CRQL and 20% < RPD < 100%	Qualify those results that are ≥ CRQL as estimated (J)
Aqueous: Both original sample and duplicate sample > 5x the CRQL and RPD ≥ 100%	Qualify those results that are ≥ CRQL as unusable (R)
Soil/Sediment: Both original sample and duplicate sample > 5x the CRQL and 35% < RPD < 120%	Qualify those results that are ≥ CRQL as estimated (J)
Soil/Sediment: Both original sample and duplicate sample > 5x the CRQL and RPD ≥ 120%	Qualify those results that are ≥ CRQL as unusable (R)
Original sample or duplicate sample ≤ 5x the CRQL (including non-detects) and absolute difference between sample and duplicate > CRQL	Qualify those results that are ≥ MDL as estimated (J) and non-detects as estimated (UJ)

A separate worksheet page should be used for each laboratory duplicate analysis

All criteria were met __N/A____
Criteria were not met
and/or see below _____

VIII. LABORATORY DUPLICATES (Section 1)

Laboratory run duplicates samples to verify laboratory consistency and precision. They are a measure of laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

1. Difference Criteria

List the concentrations of any analyte not meeting the RPD criteria (± 20% for aqueous; ± 35% for soil). For soil duplicates, if the % solids for the sample and its duplicate differ by more than 1%, report concentrations in □g/L and calculate RPD or difference for each analyte.

Sample # _____-_____ Matrix:__-_____ Units: ___-____

ANALYTE	SQL ug/L	SQL mg/Kg	SAMPLE RESULTS	DUPLICATE RESULTS	RPD	ACTION
Al						
Sb						
As						
Ba						
Be						
Cd						
Ca						
Cr						
Co						
Cu						
Fe						
Pb						
Mg						
Mn						
Hg						
Ni						
K						
Se						
Ag						
Na						
Tl						
V						
Zn						
Cr(VI)						
Sulfide						
Cyanide						

Note: No laboratory duplicate analyzed with this data package

Laboratory duplicates actions should be applied to all other samples of the same matrix type. This qualification will also be applied to the results of all samples within a given area of the site, if deemed appropriate.

All criteria were met __X___
Criteria were not met
and/or see below _____

Actions: Indicates which criterion was used to evaluate precision by circling either the RPD or SQL for each element. If both sample and duplicate are non-detects, the RPD is not calculated (NC), no action is needed.

Table 8. Field Duplicate Sample Actions for ICP-MS Analysis

Sample Type	Field Duplicate Result	Action for Samples
Aqueous	Sample and its field duplicate ≥ 5x the CRQL and RPD > 20%	Qualify sample and its duplicate as estimated (J)
	Sample and/or its field duplicate < 5x the CRQL and absolute difference > the CRQL	Qualify results > the MDL as estimated (J) Qualify non-detects as estimated (UJ)
Soil/Sediment	Sample and its field duplicate ≥ 5x the CRQL and RPD > 50%	Qualify sample and its duplicate as estimated (J)
	Sample and/or its field duplicate < 5x the CRQL and absolute difference > 2x the CRQL	Qualify results > the MDL as estimated (J)
		Qualify non-detects as estimated (UJ)

2. Frequency Criteria

A. Was a laboratory duplicate prepared at the frequency stated in the method (1/20)? **Yes** or No

If no, estimate positive results (J) for the analyte which duplicate was not performed. If more than 20 samples/batch, qualification begins at the 21st sample.

B. Was a field blank used for laboratory duplicate analysis? Yes or **No**

If yes, estimate positive results (J) for the analyte if field blank was used for duplicate analysis.

All criteria were met __X___
Criteria were not met
and/or see below _____

IX. LABORATORY CONTROL SAMPLE (LCS/LCSD)

The assessment of the LCSs is to determine both intralaboratory contamination and matrix specific precision and accuracy. Note that for Region 2, LCS is not required for aqueous Hg and Cyanide.

LCS Recoveries Criteria

A. Aqueous LCS/Solid LCS

List any LCS recoveries not within %R criteria (80 – 120%) and the samples affected.

DATE	ELEMENT	% R	ACTION	SAMPLES AFFECTED
Recoveries_within_laboratory_control_limits				

ACTIONS: If analyte does not meet the %R criteria, follow the actions stated below:

Table 7. LCS Actions for ICP-MS Analysis

LCS Result	Action for Samples
%R 40-69%	Qualify results that are ≥ MDL as estimated low (J-) Qualify non-detects as estimated (UJ)
%R > 130%	Qualify results that are ≥ MDL as estimated high (J+)
%R 70-130%	No qualification
%R < 40%	Qualify results that are ≥ MDL as estimated low (J-) Qualify non-detects as unusable (R)
%R > 150%	Qualify detects as unusable (R) ; non-detects no qualification

All criteria were met __X___
Criteria were not met
and/or see below _____

2. Frequency Criteria

A. Was a laboratory control sample prepared at the frequency stated in the method (1/20)?
Yes or No

If no, estimate positive results (J) for the analyte if LCS was not performed.

If more than 20 samples/batch, qualification begins at the 21st sample.

All criteria were met __X___
Criteria were not met
and/or see below _____

X. ICP SERIAL DILUTION ANALYSIS (Section 1)

The assessment of the ICP serial dilution analysis is to determine the precision of the laboratory through a 5x dilution.

1. Percent Difference (%D) Criteria:

__X__ Serial dilutions were performed for each matrix and results for the diluted samples analysis agreed within 10% of the undiluted analysis for the analyte concentrations ≤ 50x MDL.

_____ Serial dilutions were not performed for the following target analytes: _____

_____ Serial dilutions were performed, but analytical results did not agree within 10% difference for analyte concentrations > 50x IDL before dilution.

List the %Ds for analytes which did not meet the %D criteria (10%/100%)

Sample # _ JC36372-4_____ Matrix:__Soil___ Units:_ug/kg__

ANALYTE	IDL	50x IDL	SAMPLE RESULTS	SERIAL DILUTION	%D	ACTION
Al						
Sb	0.32	16	6.3	0.0	100	No action
As	0.24	12	16.3	10.3	36.8	No action
Ba						
Be						
Cd	0.055	2.75	1.5	0.0	100	No action
Ca						
Cr						
Co						
Cu						
Fe						
Pb						
Mg						
Mn						
Hg						
Ni						
K						
Se						
Ag						
Na						
Tl	0.44	22	1.9	0.0	100	No action
V						
Zn						

Note: Serial dilution within method performance criteria.

All criteria were met __X___
Criteria were not met
and/or see below _____

ACTIONS: Actions apply to all samples of the same matrix. The qualification will also be applied to the results of all samples within a given area of the site, if deemed appropriate. Qualify only samples with raw results > 50x MDL.

Flag results with an (E) for elements exhibiting %D > 10%.
Estimate (J) positive results > 50x MDL for elements that exhibited %D > 10 but < 100.

Reject (R) positive results > 50x MDL for elements which exhibited %D ≥ 100%.

SERIAL DILUTION ANALYSIS (Section 2)

2. Frequency Criteria

A. Was a serial dilution analysis prepared as required by the method? **Yes** or No

If no, estimate positive results ≥ 50x MDL (J) for the analyte which serial dilution analysis was not performed.

B. Was a field blank used for serial dilution analysis? Yes or **No**

If yes, estimate positive results ≥ 50x MDL (J) for the analyte if field blank was used for serial dilution analysis.

Table 10. Serial Dilution Actions for ICP-MS Analysis

Serial Dilution Result	Action for Samples
Aqueous: Sample concentration > 50x MDL and 10% < %D < 100%	Qualify affected results whose raw data are > MDL as estimated (J)
Aqueous: Sample concentration > 50x MDL and %D ≥ 100%	Qualify affected results whose raw data are > MDL as unusable (R)
Soil/Sediment: Sample concentration > 50x MDL and 15% < %D < 120%	Qualify affected results whose raw data are > MDL as estimated (J)
Soil/Sediment: Sample concentration > 50x MDL and %D ≥ 120%	Qualify affected results whose raw data are > MDL as unusable (R)
Interferences present	Use professional judgment

A separate worksheet page should be used for each serial dilution analysis.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

XI. ICP-MS INTERNAL STANDARDS

Are internal standard added to the sample? Yes or No?

Are the proper number of internal standard added to the sample? Yes or No?

Is the % Relative Intensities for all internal standards in a sample is within 60-125% of the response in the calibration blank? Yes or No?

Note:_ICP-OES_internal_standards_used;_relative_intensities_within_the_guidance_ _document_performance_criteria._____

Action:

NOTE: Apply the action to the affected analytes for each sample that does not meet the internal standard criteria.

1. If no internal standards were analyzed with the run, the sample data should be qualified as unusable (R). Record this in the Data Review Narrative and note for CLP Project Officer (CLP PO) action.

2. If less than five of the required internal standards were analyzed with the run, or a target analyte(s) is (are) not associated to an internal standard, the sample data, or analyte data not associated to an internal standard should be qualified as unusable (R). Record this in the Data Review Narrative and note for CLP PO action.

3. If the % Relative Intensities for all internal standards in a sample is within 60-125% of the response in the calibration blank, the sample data should not be qualified.

4. If the %RI for an internal standard in a sample is not within the 60-125% limit, qualify the data for those analytes associated with the internal standard(s) outside the limit as follows:

a. If the sample was reanalyzed at a two-fold dilution with internal standard %RI within the limits, report the result of the diluted analysis without qualification. If the %RI of the diluted analysis was not within the 60-125% limit, report the results of the original undiluted analyses and qualify the data for all analytes that are ≥ Method Detection Limit (MDL) in the sample associated with the internal standard as estimated (UJ).

b. If the sample was not reanalyzed at a two-fold dilution, the reviewer should use professional judgment to determine the reliability of the data. The reviewer may determine that the results are estimated (J) or unusable (R).

Table 11. Internal Standard Actions for ICP-MS Analysis

Internal Standard Results	Action for Samples
No internal standards	Qualify all results as unusable (R)
< 5 of the required internal standards	Qualify all results as unusable (R)
Target analyte not associated with internal standard	Qualify all analyte results not associated with an internal standard as unusable (R)
% RI < 60% or > 125%, original sample reanalyzed at 2-fold dilution, and % RI of diluted sample analysis is between 60% and 125%	Do not qualify the data
% RI < 60% or > 125%, original sample reanalyzed at 2-fold dilution, and % RI of diluted sample analysis is outside the 60% to 125% limit	Qualify analytes associated with the failed internal standard that are ≥ MDL as estimated (J) and qualify associated non-detects as estimated (UJ)
Original sample not reanalyzed at 2-fold dilution	Use professional judgment Qualify sample results as estimated (J) or unusable ®

XII. DETECTION LIMITS RESULTS

The detection limit assessment is to verify that samples results are within instrument calibration range or linear range (ICP).

Instrument Detection Limits (IDL). Note IDL is not required for Cyanide.

A. IDL/MDL (or lowest quantitation limit used) results were present and found to be al levels that meet the project objectives? **Yes** or No

B. IDL/MDL (or lowest quantitation limit used) were not met for the following elements:_____

2. Reporting Requirements

A. Were sample results on Form I (or equivalent) reported down to the IDL/MDL or lowest quantitation limit used for all analytes? **Yes** or No

B. Were sample weights, volumes, and dilutions taken into account when reporting results (positive and nondetects)? **Yes** or No

If no, the reported results may be inaccurate. Request the laboratory resubmit the corrected data.

3. Sediment Sample Percent Solids (% solids):

A. Were the % solids for any sediment samples < 50% but ≥ 10%? Yes or No
If yes, estimate positive results and nondetects (J/UJ) if the % solids is 10-50%. List the affected samples:_____

B. Were the % solids for any sediment samples < 10%? Yes or No
If yes, reject all results (R) if the % solid is < 10%. List the affected samples:___N/A_____

XI. TOTAL/DISSOLVED OR INORGANIC/TOTAL ANALYTES

A. Were any analyses performed for dissolved as well as total analytes on the same sample(s)? Yes or **No**

B. Were any analyses performed for inorganic as well as total analytes on the same sample(s)? Yes or **No**

If yes, compare the differences between dissolved (or inorganic) and total analyte concentrations. Compute each difference as a percent of the total analyte only when both of the following conditions are fulfilled:

(1) The dissolved (or inorganic) concentration is greater than total concentration, and
(2) greater than or equal to 5xMDL.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

C. Is any dissolved (or inorganic) concentration greater than its total concentration by more than 20%? Yes or **No**

D. Is any dissolved (or inorganic) concentration greater than its total concentration by more than 50%? Yes or **No**

ACTION:
If the percent difference is greater than 20%, flag (J) both dissolved/inorganic and total concentrations as estimated. If the difference is more than 50%, reject (R) both the values.

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results.

_X___ Sample results fall within the linear range for ICP and within the calibration range for all other parameters.

_____ If samples results were beyond the linear range/calibration range of the instrument, were dilution performed?

List the affected samples/elements/dilution:

In the space below, please show a minimum of one sample calculation per method:

ICP/ICP-MS Computer printout

Hg/Metals by AA Computer printout

Hexavalent Chromium

Cyanide

Others

For soil samples, the following equation may be necessary to convert raw data values reported in ug/L to actual sample concentrations (mg/Kg):

$$\text{Conc. in ug/L} \times \frac{\text{Volume diluted to, mL}}{\text{Weight digested, g}} \times \frac{1\text{L}}{1000\text{ mL}} \times \frac{1000\text{ g}}{1\text{ Kg}} \times \frac{1\text{ mg}}{1000\text{ mg}} = \text{concentration in wet weight mg/Kg}$$

In addition the sample results are converted to dry weight by using the percent solid calculations:

Wet weight concentration x 100 = final concentration, dry weight (mg/Kg) % solids

OVERALL ASSESSMENT

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the QC criteria previously discussed.

2. Write a brief Data Review Narrative to give the user an indication of the analytical limitations of the data. Note any discrepancies between the data and the Sample Delivery Group (SDG) Narrative for Contract Laboratory Program Project Officer (CLP PO) action. If sufficient information on the intended use and required quality of the data is available, the reviewer should include an assessment of the data usability within the given context.

3. If any discrepancies are found, the laboratory may be contacted by the Region's designated representative to obtain additional information for resolution. If a discrepancy remains unresolved, the reviewer may determine that qualification of the data is warranted.

Note:_____